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National Petroleum News

News From Oil Industry Everywhere

VOLUME 30 WEDNESDAY, JULY 27, 1938 NUMBER 30

Court Sustains Proration With Drainage Basis

By Telegraph

AUSTIN, Tex., July 26.—A three-judge federal court recognized the right of the Texas Railroad Commission to the use of the drainage factor in a proration order when on July 25 it upheld the validity of the state's sour gas proration act and the commission's order prepared under that law. This is the first time a lower federal court has taken such recognition, the court's action heretofore having been limited to action on proration on account of market demand.

The broad interpretations by the court makes the case, attorneys familiar with the question, have asserted, one of considerable importance in that the new opinion might result in the commission gaining legal right to enter orders prorating oil to prevent drainage across lease lines.

The decision was in a plea for an injunction, filed by F. C. Henderson and others, and generally considered a test case for the new law.

While upholding the law and denying the injunction the court held open the case for further review of the commission declined to correct any injustices which inexperience under the order might show had been done the operators. The court found that the petitioners failed to show that the order was discriminatory against them.

The court stated in part:

"We find nothing unreasonable in the statute, nothing unreasonable in the orders. For all that the statute does, all that the orders do, is to make limitation and proration effective by putting an end to an existing unreasonable drainage condition, and preventing its continuance in the future."

The proration order allocated two thirds of the acreage times pressure and one third to the potential factor. This was termed the only real dispute in the case. The court stated that "for the fact—if it be a fact—that a better formula could be found for prorating the production among wells in the field, than the commission used, is no ground for an injunction."

Madison Probe Hangs In Air

By Teletype
N. P. N. News Bureau

WASHINGTON, July 26.—It was a week ago today that Federal Judge Stone at Madison, Wis., set aside convictions in the tank car case and granted new trials or dismissals to 29 out of the 46 remaining defendants—and the Department of Justice apparently hasn't recovered from its surprise yet.

J. H. Lewin, leader of the anti-trust oil attorneys, arrived in Madison apparently prepared for a lengthy stay, parading witnesses before a new grand jury investigation. But immediately after Judge Stone's decision Lewin dashed back to Washington for a conference. The grand jury was recessed "tentatively" until August 3. Word from Madison indicates that Lewin was bitterly disappointed at the court's rulings.

Justice department spokesmen have denied reports that removal of the oil investigation to some other district was being considered. But no one around the anti-trust division would say when the Madison probe would start.

One official said that the numerous conferences since the attorneys returned from Madison have been on the question of whether to bring to trial, as soon as possible, the 18 defendants for whom Judge Stone ordered a new trial, postponing indefinitely the Madison grand jury investigation.

Preparations to fight appeals of the 17 defendants whose convictions were affirmed by Judge Stone will also take up much of the anti-trust oil attorneys' time.

Added to this, is the fact that the O'Mahoney monopoly committee will call upon the justice department for much backstage help in the next few months. Another factor is trial of remaining defendants in jobber-contract case set for Sept. 26.

So, it's going to take considerable agility to keep all these balls in the air at the same time. It would not be surprising if the department let one of them drop.

New Basis For Oil Control Is Urged

Mineral Law Section At Bar Convention Hears New Theories Of Oil Legislation

By V. B. GUTHRIE
N.P.N. Managing Editor

CLEVELAND, July 26.—Two new principles upon which state regulation of crude oil production may possibly be more firmly based than upon present legal concepts were advanced at the meeting July 25 and 26 of the Section of Mineral Law of the American Bar Assn., which is in annual meeting here.

1—The paramount-industry principle of constitutional law was proposed by James A. Veasey of Tulsa, vice president of the Carter Oil Co., as a means for bringing about proper well spacing and the pooling of adjacent tracts to secure uniform well spacing throughout a field.

2—If statutes expressly prohibited the violation of correlative rights—as recognized in common law—by the individual in the development of an oil field, the interests of the public and the landowners could be more amply protected.

This concept was advanced by Prof. W. L. Summers, of the law school of the University of Illinois, in whose state modern problems are now arising in connection with the development of new oil fields.

The term, correlative rights, as applied to the development of an oil or gas pool, means that the privileges of each landowner are limited by duties to other landowners not to injure the oil or gas reservoir or to take an undue proportion of the oil or gas obtainable from it.

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Correlative Rights In Oil Development Is Summers' Theory

CLEVELAND, July 25. — If modern statutes regulating oil production expressly prohibited the violation of correlative rights, as recognized in common law; that is, injury to the oil and gas reservoir and the taking of more than a just and equitable share by the individual, the interests of the public and of landowners would be amply protected.

This was the conclusion of W. L. Summers, professor in the law school of the University of Illinois, as expressed before the Mineral Law Section of the American Bar Assn., at its meeting July 25. He spoke on the subject, "The Modern Theory and Practical Application of Statutes for the Conservation of Oil and Gas."

The term correlative rights, Summers said, is merely a sim-

(*Continued on page* 20)

Paramount Industry Principle As Basis Is Plan Of Veasey

CLEVELAND, July 25. — The paramount industry principle of constitutional law was presented to the annual meeting of the Section on Mineral Law of the American Bar Assn. here today as holding sufficient authority for state legislation governing well spacing, by James A. Veasey of Tulsa, vice president of the Carter Oil Co., dean among those in the oil industry who have followed and helped shape the state laws pertaining to regulation of oil production.

"Even a measurably intelligent self-interest should indicate to the oil producers of America that the drilling of unnecessary wells is an economic crime," Veasey told his audience. "Unless sanity, through co-operation in the industry returns, every important oil producing state should have a statute under which proper well spac-

ing may be enforced and under which small tracts in any spacing unit may be pooled on the basis of participating in the production from the unit."

Veasy dwelt but briefly on the economic need for putting a brake on the drilling of unnecessary wells in proven oil fields. Wildcatting should not be stopped, he brought out; what is condemned is the unnecessary wells being drilled in proven fields. He quoted one authority to show that, of the 24,269 wells drilled in the East Texas field prior to Jan. 1, 1938, 17,000 were drilled under permits which were exceptions to the 10-acre spacing rule established for that field.

"Leaders in the industry generally agree that, for several years, there will be little, if any, increase in the demand for crude," Veasey stated. "On that side of the equation we are dealing with a factor which, for all practical purposes, should be regarded as constant. We must bring the constant factor into comparison with the other one —that of drilling new unnecessary wells in proven fields.

"The blind incentive back of the present campaign of drilling in developed pools rests in the processes of proration. Allowables among wells in many pools are established on a flat per-well basis. In others, the measure of allowables is potential. Therefore, to gain a higher allowable for a particular property, the operator drills to that end, completely ignoring the economics of his own situation and entirely disregarding the general stability of the industry."

Basis For Well-Spacing Law

After discussing the historical background for the present concept of well spacing and pooling of adjacent tracts into a unit for that end, Veasey said the question arose as to whether there was not a broader constitutional foundation for statutory well spacing and the pooling of adjacent tracts.

Referring now to the paramount-industry principle of law, he said that the oil indusrty was undeniably an indispensable one in every state in which it operates on a substantial scale—it is a paramount industry in that state.

"Accordingly, the proposition is advanced," he stated, "that if, to promote the general well-being of the petroleum industry, and therefore the general prosperity of a state, the legislature should authorize an administrative body to establish spacing units in the oil pools of the state, adapted to the conditions of such pools and at the same time provide a method whereby adjacent tracts might be pooled to accomplish the purpose of uniform well spacing throughout the pool, such a measure is clearly within the power of the state."

In his address Veasey traced various well known cases outside the oil industry which bear upon the police power of the state in respect to the protection and encouragement of a paramount industry, and showed the growing tendency of the courts to "legislate" in the direction of the general welfare of the people at the expense of private property, even for the promotion of the welfare and prosperity of the people for long periods into the future.

An Essential Industry

As showing the paramount or all-essential nature of the oil industry, Veasey recited these conditions which he said existed in every state where oil is produced in an important way:

(a) The industry brings new capital into the state in large amounts.

(b) In point of numbers, and either directly or indirectly, it usually will be found that it employs more men than any other industry in the state.

(c) The land-owners directly are enriched by the bonuses, rentals and royalties which they receive under the oil lease executed by them.

(d) Through the spending of land-owners and employes of oil companies, vast wealth filters into practically every avenue of trade and commerce in the state.

(e) Natural gas, being an incident of oil production, that commodity, in practically every important oil state, furnishes a very cheap fuel for both industrial and domestic use.

(f) In the form of gross production, severance and other kinds of taxes, a large part of the revenues of the state and its subdivisions comes from the oil industry.

(g) Indirectly, through the industry, other important sources of revenue are created, to which the state and its municipalities may and do resort.

"In the circumstances, whatever a state, through its police power, may do to encourage, foster and enlarge the business of producing oil, that very thing it should do," stated Veasey. "The Industry has a right to ask that it be placed, and remain, on a solid economic foundation. If a police measure compelling the spacing of wells and the pooling of adjacent parcels is in the direction of bringing relatively permanent economic security to the oil industry of a state, then, within the principle of the cases that have been discussed, the measure would be upheld."

Applying the same economic, paramount-industry principle to the rights of the individual in a tract which it is necessary to pool with other tracts and operate as a unit under such a well-spacing program, Veasey stated that neither one nor a small group of operators in a pool could control the spacing of wells therein.

"The other operators who wish to space their wells widely have a constitutional position which a legislature, through a police measure regulating spacing reasonably adjusted to the situation of the two groups, may compose and adjust," he stated. "All that is needed is that the act of the legislature and any adjustment order made there shall not be arbitrary or unreasonable."

It would be assumed, he said, that the royalty owners, not on a strict acreage basis but under a standard reasonably established by the legislature, would share in the production of all wells on the unit.

HISTORIES OF CONSERVATION IN OIL STATES COMPILED

CLEVELAND, July 25.—In his report for the Section of Mineral Law to the American Bar Assn., James L. Shepherd, Jr., chairman, said the principal work of the section the past year had been the preparation, through the Oil Subcommittee, of histories from a legal standpoint of the conservation of oil and gas in a number of states. Shepherd is member of a law firm in Houston.

Tentative drafts of these histories have been prepared for most of the oil states, he stated, and by the time of the annual meeting, the histories were to have been completed for Arkansas, California, Oklahoma, Kansas, Mississippi and Michigan and in addition a history of conservation measures taken by the Federal Government. The chairman said the work was to be supplemented and completed in the coming year.

It is planned to publish these histories in permanent form, he stated, and to make them available to attorneys in the oil and gas industry, to law school libraries and to the law libraries of the appelate courts in producing states.

Producers Plan Fight On Cut In Oil 'Tariff'

N. P. N. News Bureau

WASHINGTON, July 25. — A flood of briefs in protest against the proposal to whack in half the oil "tariff" on Venezuelan crude and fuel oil in a reciprocal trade agreement with that country will be filed with the Committee for Reciprocity Information by Aug. 6, final date for filing.

Russell B. Brown, general counsel for Independent Petroleum Assn. of America, is preparing a lengthy brief in opposition to the inclusion of oil on the list of commodities on which concessions are to be granted, he told NATIONAL PETROLEUM NEWS today.

Brown said several state organizations of producers had asked to join I. P. A. A. in its brief.

Although it was reported earlier that the Oil Workers International Union planned to submit a brief in the case, officials of that organization today said no definite plans for any stand "one way or the other" had been made.

It is understood that a number of the state regulatory boards also will be represented by briefs, as well as at the hearings, scheduled to begin here Aug. 15.

Another producers' group which will be represented by a separate brief in opposition to the proposal is the Oil Producers' Agency of California, headed by Rush M. Blodgett.

None Filed Yet

C. R. I. officials say no briefs have been received as yet, although they add that they will not divulge names of persons or organizations submitting briefs, even when they are filed.

Under the law, the President may increase or decrease any existing import duty, tariff, or excise tax on imports by 50 per cent, in connection with these reciprocal trade agreements. In the Venezuelan case, the proposal would, of course, be to cut the present 21-cents-a-barrel import excise tax the limit — that is, to 10.5 cents a barrel.

Just what is behind this proposal to enter into such an agreement with Venezuela is not clear. Of course, it is one in a long series of such agree-

ments, and will be defended by administration stalwarts as carrying out the "good neighbor" policy and knocking down trade barriers.

But, almost 70 per cent of all Venezuela's exports to the United States are of crude and fuel oil — $15,760,500 worth in 1937, when total exports to U. S. were but $22,770,000. In the case of none of the other trade agreements, it is believed, has one commodity made up such a large part of total trade; and certainly not a commodity of which the United States produces more within its own borders than does any other nation.

Under the "favored nation" policy of the U. S. government, whenever any reduction in duties or import excise taxes is accorded to any government, it is automatically accorded to all other nations which have not been proclaimed to discriminate against United States trade.

Since Germany is the only country now under such a proclamation, reduction of the tax in the Venezuelan agreement would mean reduction as applied to virtually all imports of crude and fuel oil. Imports of crude and fuel oil in 1937 amounted to 32,501,000 barrels.

Venezuela's share in this volume was 21,272,000 barrels, and much of the rest came in from Colombia. The United States has a reciprocal trade agreement with Colombia, although no petroleum products are included on the list. Imports of Colombian crude and fuel oil would, however, be subject to the same concessions as Venezuelan imports if the treaty were negotiated as proposed.

Three Unions on Ship

N. P. N. News Bureau

WASHINGTON, July 25.—A muddled administrative situation may be the chief result of the certification this week of three separate unions to represent employes of Richfield Oil Co. steamship line, San Francisco, for collective bargaining purposes.

National Labor Relations Board certified Sailors Union of the Pacific, which has voted to affiliate with the American Federation of Labor, as bargaining representative for unlicensed deck personnel; Pacific Coast Marine Firemen & Oilers Assn., affiliated with neither of the two major labor organizations, to represent engine department personnel, and Marine Cooks' and Stewards' Assn. of the Pacific Coast, an affiliate of the Committee for Industrial Organization, to represent stewards department personnel.

Hull's Sharp Note Indicates U.S. May Act on Mexican Oil

N. P. N. News Bureau

WASHINGTON, July 25. — A demand that Mexico either pay up promptly, in cash, for properties of American oil companies which the Mexican government expropriated early this year, or submit the question of payment to arbitration, is expected to go forth from the U. S. State Department before long.

Last week's sharply-worded note which Secretary of State Hull handed to Mexican Ambassador Najera, although dealing strictly with the matter of payment by Mexico for agricultural lands she has expropriated from U. S. nationals over the past 23 years, is regarded as laying the groundwork for a similar position on the expropriated oil properties.

Usually reliable sources confirm this interpretation, although Hull's only comment on questions by newspapermen who have attempted to get a statement linking the agrarian land note to the oil expropriation has been that the note "speaks for itself."

Although the note handed to Najera did not contain any reference to the oil properties, the position Hull set forth on strict observance of international obligations is equally applicable to the petroleum seizures as to the seizures of the farms of American nationals.

Some observers here regarded the fact that the note was based upon the agrarian seizures rather than the taking of the far more valuable oil properties as significant in two respects. In the first place, there are those who think some of the dealings of some American oil companies in Mexico have not always been above reproach. This, combined with the attitude which the present administration has taken toward so-called "big business" generally, and to bigness in the oil industry in particular, might have made a direct stand for immediate payment for the oil properties appear a little out of character.

Public Sentiment

On the other hand, by demanding payment for lands of the "farmers" which the Mexican government has seized, this government is certain of a stronger public sentiment from its people. It is also more in line with the avowed aims of the Roosevelt Administration.

The same principle demanded in the "farm land" note — that of "adequate, effective, and prompt compensation," — is expected to be applied in the oil situation, when the time comes for action. The State Department will probably suggest submission of the question of "how much" the companies shall be paid for their properties to arbitration, likewise.

The fact that the agrarian land expropriations, which have been going on since 1915, have not drawn the wrath of the State Department before this, but that the note was not handed the Mexican ambassador until some months after the oil expropriation, is regarded as significant also.

As Secretary Hull said back in March, when questioned at a press conference as to what the government planned to do about the oil expropriation, this seizure was just another in a long series. It was, however, the first seizure of American industrial properties.

Hull's "linking" of the oil expropriation with the agricultural land seizures at the outset would appear to make everything said in last week's note about "prompt payment" equally applicable to both.

Like British Attitude

If this interpretation of the note is correct, then the position of the United States with regard to the expropriation will be similar to that of Great Britain, whose companies suffered the same fate in Mexico as the American companies. Britain sent a note some months ago demanding return of the expropriated properties — apparently because her statesmen felt Mexico's financial status made a demand for cash payment a superfluity.

But, in the eyes of U. S. diplomats, preservation of the "good neighbor" policy is the paramount issue. As Hull said in his note, the good neighbor policy is not a "unilateral" affair, but must always be "bilateral and multilateral."

In the new attitude of the State Department is to be found a reflection of the sentiment expressed in an address by Maj. T. R. Armstrong, Standard Oil Co. of New Jersey official, at the Virginia Institute of Public Affairs in Charlottesville, Va., early this month, when he asserted:

"Far more is involved in the current issue than the oil properties in Mexico. If Mexico can get away with its present arbitrary act, there is no safety for American property anywhere in Latin America, or elsewhere, and sooner or later in some part of the world, drastic action will be called for."

Insistence upon payment for the expropriated lands was one of the few steps left open to this government, if it hoped to be in a position to insist upon its rights at some future time in Latin America or elsewhere.

Can Mexico Pay?

But, the question of Mexico's ability to pay is another problem, and in the eyes of some observers, a serious one.

Should the United States go beyond the "note sending" stage, what might happen to the none-too-secure Cardenas regime? The present U. S. administration is in sympathy with most of the social-improvement aims of the Cardenas government, and would be loathe to see it overthrown—particularly by a government with which it might find dealing on a "good neighbor" basis much more difficult, if not impossible.

1938 Oil Exports Lead 1937 by 15%

N. P. N. News Bureau

WASHINGTON, July 25. — During the first six months of 1938 there were $196,300,000 worth of petroleum and products exported from the United States, according to Foreign and Domestic Commerce Bureau reports.

During the first six months of 1937 the exports amounted to but $169,900,000, the figures show. The 1938 exports were more than 15 per cent greater in value.

Value of petroleum imports during the first half of 1938 was $20,300,000, compared with $20,600,000 in the same period of 1937.

The following table shows comparative figures for principal exports during the first half of 1938 as compared with 1937:

	1937	1938
Crude (1,000 bbl.)	28,442	40,176
(1,000 dollars)	40,373	59,170
Gas and fuel oil (1,000 bbl.)	19,465	21,663
(1,000 dollars)	24,529	29,057
Motor fuel (1,000 bbl.)	13,867	19,167
(1,000 dollars)	35,873	49,034
Lubricating oil (1,000 bbl.)	5,517	4,903
(1,000 dollars)	43,495	35,622

Truckers Lose Fight Against Nebraska Law

LINCOLN, Nebr., July 25. — The Nebraska law regulating truck transport tank trucks, including a ban on Sunday operations, has been held valid in a decision by Lancaster County District Judge Polk in denying a permanent injunction.

What action will be taken now is undecided. C. M. Sutherland & Sons, of Lincoln, attorneys for the oil truckers, has announced, although a motion for a new trial will be filed at once.

The transporters may elect to fight the law, L. B. 97, through higher courts, or seek repeal at the forthcoming session of the legislature.

The law was enacted at the latest session of Nebraska's unicameral legislature, and imposed severe restrictions on petroleum transporters, who bring in more than 50 per cent of the state's oil requirements from Kansas by truck.

"It is very likely that the United Transporters of Petroleum Products will carry this fight to the Nebraska supreme court," said C. Austin Sutherland. "We are confident that this case can be won in the supreme court and that the prohibition against engaging in interstate commerce any day of the week cannot be sustained."

Southeastern Rate Cut Hearing Asked

N. P. N. News Bureau

SHREVEPORT, La., July 25. — A request that the petition of the southeastern railroads for a reduction in rail rates from the New Orleans-Baton Rouge group to certain Tennessee river points in Alabama, without corresponding reductions from points west of the Mississippi river, be assigned for public hearing has been made to the Interstate Commerce Commission by the traffic division of the Shreveport Chamber of Commerce.

The rail carriers had asked the I.C.C. for a reduction to meet barge competition on the upper reaches of the Tennessee river (See, N.P.N., July 20, page 13). The Shreveport request, contained in a letter signed by W. S. Cornell, manager of the traffic division of the Shreveport organization, follows:

"Referring to Mr. Kerr's 'petition of southern carriers for modification of order entered herein November 3, 1931' such petition referring to ICC docket 17,000, part 4 'rate structure investigation petroleum and petroleum products' dated Atlanta, Ga., July 12, 1938, proposing reduction in rates on petroleum and its products car load from New Orleans, Baton Rouge, etc. to Florence, Sheffield, Decatur, Guntersville, Ala., without corresponding reduction in the rate from refining points west of the river.

"In behalf of our members, we respectfully urge that the commission assign this application for public hearing as there is no justification for a reduction from points on and east of the river to the territory involved without giving consideration to rates on petroleum and its products from points located west of the river."

Week-End Ban on Trucks Is Speedily Killed

N. P. N. News Bureau

WASHINGTON, July 25. — An attempt to bar from the highways over week-ends all trucks except "milk, mail and newspaper delivery" trucks was rejected without a dissenting vote by the committee on uniform traffic laws and ordinances, National Conference on Street and Highway Safety, which met here last week.

The proposed amendment to the uniform code was submitted by Arthur J. Lovell, Brotherhood of Locomotive Firemen and Enginemen.

The proposed week-end ban on all trucks except those described would have, if accepted, recommended to the 48 states legislation which would have barred oil trucks from the roads from Saturday night to Monday morning. Thus, service station operators whose gasoline supply ran out on Sunday would, in states which accepted the recommendation, have to close up for the remainder of the Sabbath.

Few other amendments to the uniform code, which is recommended to states, were acted upon at the session, among them being new speed-limit regulations, hand and arm signal recommendations, and automotive inspection law changes.

Kansas Intrastate Rates Set for Hearing

N. P. N. News Bureau

WASHINGTON, July 25.—An Interstate Commerce Commission examiner will hold hearings at Topeka, Kans., Aug. 24 to determine if railroads may apply the 10 per cent increase in freight rates granted by ICC in March to Kansas intrastate shipments of petroleum.

Railroads petitioned ICC in the case after they said Kansas Corporation Commission had refused to authorize the 10 per cent increase as applied to intrastate shipments of petroleum and certain other commodities, including brick, sand and gravel and livestock.

Under the Interstate Commerce Commission Act, the ICC is given authority to regulate intrastate railroad rates if they are found to affect interstate commerce. Chief purpose of the Topeka hearings will be to determine whether the ban on increasing intrastate rates does affect interstate commerce, and if so, to order the increase. The ICC authority transcends that of the Kansas commission, under the Interstate Commerce Act.

Truck Movement of Oil Increases in June

N. P. N. News Bureau

WASHINGTON, July 25. — June truck loadings of petroleum products were 8.14 per cent higher than May and 3.72 per cent over June, 1937, American Trucking Assns., Inc., reports.

For all commodities moving by truck, June loadings were 3.60 per cent over May, and 8.72 per cent over June a year ago.

A Back Seat Driver Has Her Say

CLEVELAND, July 25.—One of the most unusual advertisements ever published in NATIONAL PETROLEUM NEWS appears on page 34 of this issue. It is the message of an elderly Pennsylvania automobile passenger to executives of Tide Water Oil Co. in connection with that company's current $25,000 safe driving slogan contest.

Mrs. Lily A. Long of Kenridge Farms, near Bethlehem, Pa., says she has tried not to be a "back seat driver", although she has had her thoughts, and she is so enthusiastic about the Tide Water contest that she is spending her own money to congratulate that company's executives on their "public spirited effort to reduce the toll of traffic accidents."

In her "copy" Mrs. Long repeats the eight safety suggestions from her contest entry, which are in the form of an acrostic. The last one indicates that she has been a reader of oil industry advertising even though she is not a driver herself. "Lubricate your car for safety," she urges.

Grand Jury Indicts 20 In Toledo Strike

N. P. N. News Bureau

CHICAGO, July 25. — Twenty individuals will be arraigned at Toledo, O., this week on indictments charging lawless acts during the recent strike at Pure Oil Co.'s refinery in that city.

Arraignments were scheduled for July 22 but defense counsel obtained a week's delay for filing answer.

Lucas County (Toledo) grand jury returned five indictments with nine counts. Some individuals were named in several indictments. Some of those named were reported to be members of a C.I.O. union.

Eleven men are charged with assaulting two Pure Oil foremen, William B. Hartman and Samuel Hammond, on May 17. Hartman was taken from his car and severely beaten.

One man is charged with damaging the home of a Pure Oil electrician, Bert Haney. Haney's home was smeared with red lead paint, causing damage of $300, on June 4.

Six men are charged with chasing Russell Schroder, Pure Oil employe, and threatening to take him for a ride.

Nine men are charged with assault and battery and malicious destruction of property in upsetting the automobile of Oliver L. Buckmaster, Pure Oil employe. Damage was $105.

The strike at Pure Oil's plant was called on May 13. Two days later, at the request of the Lucas county sheriff, Pure Oil closed the plant to avoid violence.

CHICAGO, July 25. — Skelly Oil Co.'s division office in Chicago is moving Aug. 1 from 121 W. Wacker Drive to the company's new bulk plant at 4814 Richmond Ave.

ICC Helps Rails by Hike in Oil Trucking Rate

ICC Sets Precedent in California Case By Prescribing Minimum Trucking Rates

N. P. N. News Bureau

WASHINGTON, July 25. — A new chapter in the railroads' war against trucks for movement of petroleum products was written today when the Interstate Commerce Commission prescribed minimum rates for an oil trucker, forcing him to raise his rates so that the protesting rail carrier could "compete" without cutting its own rates to the trucker's level.

This is the first time that the ICC has made use of its powers under the Motor Carrier Act to prescribe minimum rates for an individual truck operator.

To meet the competition of a California-Utah truck operator hauling petroleum products for Associated Oil Co., Southern Pacific railroad proposed to the ICC that it be permitted to cut its rates to meet the truck competition. This proposal, however, drew fire from other rail carriers and from Standard Oil Co. of Indiana, whose subsidiary Utah Refining Co. operates in that territory.

The ICC solved the problem of pleasing nearly all the parties by denying the rate cut asked by Southern Pacific and ordering the Lang Transportation Co., the truck involved, to raise its rates to a level with the rail rate and, in one instance, to maintain the truck rate five cents per 100 pounds *above* the rail rate between certain points.

Started in 1934

The California-Utah case arose out of minimum rates prescribed for rail carriers early in 1934, when a rate of not less than 73 cents per 100 pounds was set on rail shipments of gasoline between San Francisco Bay points, including Sacramento, Ogden and Salt Lake City, Utah.

In the 1934 decision, ICC held that a proposed 60 cent rate was "lower than necessary" to retain to the rails the traffic, and that 73 cents would not be so high as to divert any traffic.

Subsequent to this, "the situation changed," according to ICC's report, due to motor truck competition which made "severe inroads" on the rails' tonnage. This brought a petition by Southern Pacific for a vacation of the 73-cent minimum rate order, again seeking authority to publish the lower rates.

The trucking company to which most of the traffic went, according to ICC, was Lang Transportation Corp., which the report says, published rates of 46.5 cents from Sacramento and 51.5 cents from San Francisco Bay points to Wendover, Nev., from which point Associated Oil Co., sole user of the service, was able to carry the gasoline in its own tank trucks to Ogden and Salt Lake City for 13.5 cents. Thus, the combined rate over Lang from Sacramento to Ogden was 60 cents, and from Bay points, 65 cents.

Later, Lang increased its rates so that the combined charges were 66 and 71 cents, respectively.

Compete With Standard

In entering into the agreement with Lang for the low-cost hauling, Associated, according to ICC's report "apparently was desirous of securing lower transportation costs for the purpose of more effectively competing with the Utah Refining Co. (Standard of Indiana subsidiary) in the Salt Lake City area."

About this time a number of other railroads and oil companies entered a formal complaint against the Lang rates, thus making two cases involving substantially the same situation. Most complainants in the Motor Carrier Act case against Lang were protestants against Southern Pacific's proposal to publish lower rail rates. Decisions in both cases were handed down by ICC simultaneously.

Complainants in the second case included Standard Oil Co. of Indiana, Burlington railroad, Denver & Rio Grande railroad, Union Pacific, Utah Oil Refining Co., and Western Pacific Railroad.

In hearings on the earlier case, Southern Pacific told the commission it was "confident" it would get at least half of the traffic of Associated to the Utah cities if its rates were equalized with the truck rates which Associated was using, through Lang.

'Might Incite Rate Reductions'

ICC held, in deciding this case, that if it allowed Southern Pacific to publish lower rates to meet the truck competition offered by Lang, it would "incite widespread reductions in other reasonable rates and result in aggregate revenue losses to railroads generally in Mountain-Pacific territory which would be much greater than any revenue gain to respondent (Southern Pacific)". This was the attitude of the protestants.

So the commission affirmed its previous order establishing the 73-cent minimum rail rate with the comment that "it seems undesirable to leave this sensitive rate situation unprotected against publication later of lower rates."

But its decision in the Lang case serves the same purpose, as far as the railroad is concerned—equalization of truck-rail rates—and at the same time will result in it receiving 73 cents per 100 pounds instead of the truck-competitive 66 cents.

The ruling on the Lang case held that the 66-cent combination rate from Sacramento (where Associated has large tankage facilities) to Ogden and Salt Lake City was non-compensatory for the truck line, and that it was "unreasonable".

The commission held that the truck rates were "unreasonable to the extent they are less than 59.5 cents per 100 pounds from Sacramento to Wendover and 64.5 cents from . . . (San Francisco Bay points) to Wendover."

Application of the 13.5 cent cost of transporting products from Wendover to Ogden and Salt Lake City to these minimum rates, brings the Sacramento charge into alignment with the minimum rail rates affirmed in the other case—73 cents from Sacramento.

As for the truck rate from the Bay points (5 cents higher than rail), ICC points out that Lang has heretofore maintained a 5-cent differential as between the Bay points and Sacramento, and since "defendant has handled very little traffic from the other (Bay) points (it) should not be appreciably affected if required to continue the differential."

According to the report of ICC, bulk of Associated traffic carried by Lang has been from Sacramento, to which point it moves in Associated barges upriver from the Bay.

Any less charge than 5 cents for the 90 miles of trucking from the Bay to Sacramento would be unreasonable, according to the commission. There is no rail differential as between traffic originating at Bay points and that originating at Sacramento.

'38 Gasoline Tax Receipts Lead '37 at Half-Way Mark

N. P. N. News Bureau

WASHINGTON, July 25. — Gasoline consumption in the U. S. passed July 1, the half-way mark for 1938, with gallonage figures still ahead of last year by more than 60,000,000 gallons, according to federal gasoline tax collections.

Internal Revenue Bureau figures today revealed that receipts from the one-cent federal gasoline tax during the first six months of this year amounted to $90,652,278.88 as compared with $90,029,578.83 in the same period last year.

This increase was registered despite a decrease shown for May and June this year. June collections were $15,543,571.81 as against $17,561,468.61 in June, 1937. April collections this year, on the other hand, hung up a 20 per cent increase over April, 1937, indicating that perhaps some of the April increase should have been spread over the latter part of March and first part of May.

Gasoline tax receipts for the fiscal year ended June 30, 1938—covering the last six months of the 1937 calendar year, when the current business recession began, and the first half of 1938—amounted to $203,648,079.78. This was a gain of 3.62 per cent over the same 12-month period of 1936-37 when receipts totaled $196,532,813.

In making up the federal budget estimates for the fiscal year just ended, the Budget Bureau figured gasoline tax receipts at $204,000,000, a figure which the actual collections missed by only $350,000—a small fraction of one per cent. The budget estimate was made early in 1937.

Lube Tax Receipts

Collections on the lubricating oil tax during the first six months of the calendar year 1938, amounting to $13,732,425.94, were more than $2,000,000 below collections during the same period of 1937—$15,848,996.06. June collections, however, amounting to $3,107,636.70, were above those for June last year—$2,950,212.00.

The Federal tax on lubricating oil during the fiscal year 1938 brought in $31,565,020.29, almost $2,000,000 below the first budget estimate, made in early 1937, of $33,300,000.

National Petroleum News

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Published every Wednesday by The National Petroleum Publishing Co.

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FOUNDED 1909
Member of Audit Bureau of Circulation and Associated Business Papers, Inc.

Publication office: 1213 W. Third Street, Cleveland, O.
Telephone, CHerry 7672 Cable Address, Plattoil, Cleveland

NEWS BUREAUS

New York, 50 W. 50th Street, Telephone, COlumbus 5-1516 and 5-1517.
Chicago, Buckingham Bldg., 59 E. Van Buren Street, Telephone, Harrison 5901-2-3.
Washington, D. C., 1002 National Press Bldg., Telephone, NAtional 0654.
Tulsa, Okla., 904 World Bldg., Telephone, 3-7132.
Los Angeles, 610-A Hillstreet Bldg., 815 South Hill Street. Telephone, VAndike 2845.

Subscription rate $3 per year in United States and Mexico; $4 in Canada; $4.50 Foreign Countries. Current copies 10 cents, except special issues; back copies more than two months old 20 cents per copy.

THE SCORE
In the First Madison Oil Case

By WARREN C. PLATT, Editor

	Individuals	Oil trade papers	Oil companies
Indicted	56	3	23
Not brought to trial for various reasons	10	..	..
Dismissed by the government at the end of its case for lack of evidence	1	3	4
Dismissed by the court at end of the government's case for lack of evidence	15	..	3
Convictions set aside and indictment dismissed by trial judge for lack of evidence	10	..	1
Convictions set aside and new trial ordered by trial judge	15	..	3
Convictions allowed to stand and fines assessed	5	..	12

Such today is the score in the Roosevelt Administration's greatest anti-trust case and one of the largest in American history in point of prominence of the defendants and the dollars they represent.

When the case gets through the court of appeals the attorneys expect the score to be much less, perhaps even zero, because of the gaping holes in the government's part of the suit. In fact the government may have serious trouble on a retrial, lawyers say. The government has only half its indictment left to retry on, as it had to drop out the trade papers long ago for lack of any evidence whatsoever. This may be fatal to the cases now going to the court of appeals.

There is much that could be written about this trial and much that should be written, that the American people may have a clear picture of one industry's difficulties with the government of these restless days. But it would take months to gather and put the material in shape.

There has just come into public print a report which reaches to the very foundations of this country's judicial procedure. To even do that one phase of the Madison cases justice would take more space than is possible here. But here is the point in brief:

Immediately that Judge Stone ruled against the government at Madison last week in regard to 25 of the individual defendants and 4 of the remaining company defendants, the government attorneys hurried to Washington, where they have been in secret conference ever since. The new and mysterious grand jury investigation for which several score of witnesses had been called, many of whom were at Madison, was postponed two weeks. Today no announcement can be obtained from the Department of Justice as to whether that postponement will be lengthened.

The real explanation for the postponement and the lack of definite date as to any resumption of the investigation, as given by BUSINESS WEEK, July 23rd issue, a publication whose Washington reports have been extremely accurate, is that the Department of Justice is so dissatisfied with the judge's decision that it is looking around for another court to which it would move further proceedings. It is common knowledge that government attorneys were greatly disappointed over the court's setting aside the convictions and that the government counsel expressed disapproval in strong language.

It was while the case was still before the court at Madison that representatives of the Department of Justice admitted to a Senate committee that the department hand-picked the courts for its various proceedings in order to make as certain as possible that it would win its cases. The oil case was still pending when Roosevelt made his spectacular move to "reorganize" the U. S. Supreme Court so as to insure favorable decisions on his legislation. The debate over that move has been on ever since Judge Stone began consideration of the jury's verdict.

One sitting in that court room at Madison from day to day, with his liberty, his reputation and his dollars in jeopardy on what he knew was an absolutely false and cooked-up charge, could not help but wonder what effect all this debate about stacking the courts and picking judges that would "favor" the administration, was having on the judge then presiding over his fate? One wondered if the administration and the Department of Justice, by their very admission that they selected judges with an eye to how they thought on administration ideas, realized that they were casting suspicion on every judge they thus selected, no matter how honorable and upright his record?

One wondered if these representatives of our government appreciated that, if that judge decided against the administration's wishes he could expect to be condemned by it, perhaps forbidden promotion to a higher court,—and that if the judge decided for the administration he would ever after be suspected by many people at least of having responded to the administration's hopes and wishes and given some preference?

Sitting there in that court room, especially the first few days, one wondered about a lot of things in connection with the case, now that the administration at Washington called particular attention to them. One remembered that Judge Stone was appointed by Roosevelt early in his term. One recalled that only one defendant lived in Wisconsin and he in another district. Some of the defendants had to come a thousand miles and more. One recalled that the Department of Justice when asked why it picked Wisconsin said something about this judge not being "very busy." One also recalled that Wisconsin had been known for years as a radical state, with a radical university at Madison, a radical governor and senator whose father had been "agin" most everything that had to do with business.

One recalled the tales that trickled out of the grand jury room where he was indicted, tales of "third degree" methods evidently undertaken in a sense of safety in the seclusion and the sanctity of the grand jury. There were tales of witnesses who did not testify to what the two government attorneys wanted, whether they knew it or not,

Government Has Low Batting Average At Madison

and were bullied and damned and their testimony warped and twisted.

If ever there was an inquisition pulled in this country that violated all law and rules of fair play that grand jury was it. The character of that rough work was indicated and condemned in the way Judge Stone handled the government's effort to use that testimony in the trial and in the part that the judge finally, in his charge to the jury, threw out all reference to it by saying that nothing that any grand jury witness said during the trial was in conflict with his testimony in the grand jury room.

That the government attorneys first thought they would be allowed to conduct the case according to their own ideas was shown by their early conduct in the court room. They undertook to dictate to the court and even to the defense as to how it should conduct its case. They interrupted whenever they wanted to, disregarded rulings and at the start of the trial acted as if they were the judge and jury as well as prosecution. Repeated warnings from the bench were ignored. Only orders sharply given seemed to sink in.

The government attorneys left little doubt in any observer's mind that the judge was expected by the government to be "favorable" at all times. Time and again government attorneys demanded that the court give them the benefit of all doubt because, as they said repeatedly, the government if it lost could not appeal. Therefore the time honored principle of law that the defendant is presumed innocent until proved guilty was not to apply in this case.

Had the court abdicated the bench and allowed the government attorneys to try the case as they wanted to, it would have been one of the greatest farces, one of the great tragedies, of judicial history.

When the government some weeks ago announced a new grand jury investigation to begin the day after the judge handed down his rulings on motions of the defense to set aside the verdict, there was much conjecturing. The government made no explanation of the move. The supposition was that the government was going fishing for more evidence to use in the case set for September against The Texas and Gulf and other companies that did not plead nolo contendere in the jobber's margin case.

Also the supposition was that the Department of Justice was a little fearful of the judge's possible ruling and thought it could "crowd him" a bit by having a grand jury investigation handy that might be able to crack down new indictments on any defendants the judge would let go.

For the layman, let it be said that seldom does a grand jury in a complicated case such as these oil cases, exercise any opinion of its own in returning an indictment. The matter is decided for the jury by the prosecution. Back in the early days in this country, when crimes were simple, a grand jury could exercise its prerogatives but in these days of complicated cases, neither grand juries nor trial juries seldom get much of a clear conception of what it is all about. So in this new grand jury move the government, if it could drum up any kind of testimony such as the hearsay testimony it presented to the first grand jury, could easily ring in more indictments for alleged continuation of the crime of 1935-36 and thus put the court, seemingly, "behind the 8-ball."

But despite all this government maneuvering for "favorable" judges, the box score on this Madison case tells the story — 56 individuals and 23 oil companies and 3 trade papers indicted with a great blare of trumpets, but only 5 individuals and 12 oil companies fined. Very evidently an American judge decided the case as he saw it, and in accordance with the illustrious tradition of the American bench and without benefit of soviet direction from Washington.

This whole case, from the very beginning of the oil industry's relation with the government back in 1933, raises and questions the good faith and honesty of conduct and motives of government officials.

There is the year and a half of continued battle with government inefficiency; battles with apprentices, many totally unfitted for their tasks of working with a great industry. There was the long fight for enforcement of "hot" oil regulations with the enforcement agency loaded with incompetents and political apprentices including relatives of Roosevelt and Ickes. There was the episode of the missing paragraph from the oil code, the one paragraph that could be effective against "hot" oil and which disappeared between the typing of the final draft of the code and its being signed by the President, and which missing paragraph was not discovered for a year thereafter.

There was the ever insistent demand of the administration that the price of crude had to be maintained regardless, at $1 a barrel and wages and hours held to the new standards. With this demand went promises to enforce the code to bring about and maintain fair prices at the refineries, bulk plants and service stations but these promises were never fulfilled. Thousands of oil marketers sat on committees to enforce the code and reported in vain hundreds of cases of code violations to government which, if acted upon, stood to make the financial life of an oil marketer somewhat worth living.

There were all the various buying programs to try and raise the price of gasoline at the refineries, despite the flood of "hot" gasoline from East Texas.

Then, at last, there was the enactment by Congress and the enforcement of the new Connally "hot oil" law, in February, 1935, the reduction in gasoline production and in gasoline stocks by government order, an unexpectedly big increase in gasoline demand and finally by a code committee with government knowledge and seemingly approval a sorting out of buying orders from major companies to the smaller refiners who had been losing their shirts.

All through this year and a half of the code the oil industry's experience with the good faith of government had been growing more and more unsatisfactory. It was climaxed a year later by the government seizing on the acts of the sorting-out-committee—also known as the "buying program" committee, to bring indictments for alleged violation of the anti-trust laws.

If what the government charged in its indictment was true then the only thing that saved the price of crude oil as per the government's demands, was this "buying program" organized by oil companies operating in the Mid-Continent because otherwise, the government says, the price would not have advanced to cover cost of the crude.

If what the government says in its indictment is true that only this "conspiracy" saved the oil industry from ruin, then indeed have we an example of government perfidy and "double-double-crossing", as Democratic Senator Thomas of Oklahoma, called it the other day, the same Senator Thomas who received the Roosevelt blessing for his return to the Senate.

The Department of Justice fought for days to limit the trial of the case to its submittal of evidence to show only that there was a "buying committee" and that its efforts alone raised the refinery price — built the "steps of greed and avarice." The government opposed most vigorously the presentation of the story of all the other factors which to most people brought about the rise in price, and it fought the presenting of any reference to the period of

What Did Oil Jobber Get Out Of Madison Case?

the oil code, the demand of the administration for the price of crude and its maintenance and the failure of the administration properly to attack the situation. The Department demanded that the acts of a handful of men be given sole credit for the rise in the refinery price and that this constituted the "conspiracy in all its hideous details."

For a year and a half the government had in its possession the records of the sale and the price of every tank car of gasoline made in the midwestern area during the period covered by the indictment.

For a year and a half the government had in its possession the facts which showed that the advancing price in the spring of 1935 was brought about by the bids of brokers and a few jobbers who consistently bid higher than market prices for gasoline during this period and it was not until several days after these sales that the publications reported higher prices.

For a year and a half the government had in its possession all the facts to show that the major companies purchased at the low and below the low of the price publications in all but a few per cent of their purchases during the period of the indictment and that the prices reported by the publications were exactly the prices being paid by the jobbers in open spot market transactions and not the higher and false prices charged by the government.

If the Department of Justice investigated this case with all the care that it says it did, if it turned its wonderful G-men loose on it for all the months that it says it did, then the Department of Justice knew these facts and knowing them, then it falsified in its indictment and it falsified in the alleged evidence it presented in court and its attorneys falsified repeatedly in statements they made.

If the department did not know these facts in its possession all this time, then the department not only falsified in its statements as to the character of that investigation but it so violated the first rules of preparing a case that it should be investigated and severely punished by Congress for, if it is to pursue the same incompetent mendacious course in other proceedings, more American citizens undoubtedly will be put to great expense in defending the rights that the Department of Justice is supposed to stand for.

Either way the department wants to say it, the honor and honesty and good faith of the department and of this administration is at issue in this case.

But what of the policy of the Roosevelt administration in causing or allowing this case to be brought? That is one of the mysteries. There are all sorts of suggested answers from plain dumb malicious ignorance in the Department of Justice with every one busy on the presidential campaign, to an alleged desire on the part of Roosevelt to try and get enough on a big industry, particularly a natural resource industry, so that he could arrange to place upon it a form of government control as would add to his power.

But whatever the motive that prompted the administration to cause or to permit this case to be brought, the case challenges the fair dealing and decency of the administration. According to the record of the code days, after the government had failed miserably to protect the price of crude oil, then the government in this case says a small group of men succeeded. But the government says that even though they started their successful efforts during the code period and as members of a special code committee, even though they reported those efforts to the proper government code authorities at Washington and even though those code authorities were so well pleased with the result and so heartily approved of it they asked one of the oil committee men to try and do the same thing in Pennsylvania, "they deserve severe personal punishment", to quote the words of the head of the anti-trust division of the Department when the case was begun.

And President Roosevelt knew all about this, at least, almost from the minute the indictment was handed down. He was told the story of this official double-crossing of the industry many times.

With the federal government moving heaven and earth to fix and maintain prices on all kinds of commodities and products, with the avowed chief purpose of the late "blue buzzard" to permit industries to fix prices, with the Roosevelt administration spending hundreds of millions of the taxpayers' money to carry on price fixing schemes today, certainly it ill behooved the government's attorneys to make such outcries of shame and horror at these refinery representatives sorting out purchase orders and urging buyers to pay a "reasonable price", when they were doing it to carry out the plan of the administration.

Even these horrified government attorneys said that, had these same "steps of greed and avarice" been built by following a certain rule in the code, then it would have been all right and the higher price level would have been clear of any taint of sin, and presumably it would have been all right for the public to pay $90,000,000 more for its gasoline, which was the way the attorneys figured it.

In fact, to add to the ridiculousness of it all, I am quite sure that somewhere in the government's argument I have read the statement that the refinery tank car price would have advanced without the efforts of the "buying committee" because of the Connally law, the limitation on gasoline manufacture and government orders to reduce gasoline stocks so some of the companies would have to go into the tank car market and buy. That must have been a slip, forgivable perhaps in this maze of duplicity.

So all this case finally boils down to is that the "buying program" committee only did what the government wanted done and what government had failed to do and that maybe the program committee did not affect the price after all, and that it only technically violated a law, as Judge Stone said in his recent ruling which the government does not like.

And how about the Independent oil jobber on whose complaint and behalf, presumably, this case was brought?

He seems to have been lost sight of in the whole business. What the jobber complained of in June, 1935, was the 5.5-cent gross margin as against the 6-cent margin which had been put in effect at the start of the code and which continued to September, 1934. Then the flood of "hot" gasoline was at a high point and was wrecking retail prices all over the middle west and threatening the administration's sacred price for crude oil. At that time the Standard of Indiana reduced its own gross margin between tank car and retail service station price to 5.5 cents. All other companies followed.

The particular level of tank car prices was not the chief cause of the jobber's condition as the Standard of Indiana testified that it added its 5.5-cent margin to the Oklahoma tank car price, whatever it was, and fluctuated it with that refinery price as reported by the trade publications.

The jobber, according to all reports of those jobbers who met with the Department of Justice in June, 1935, did not make any reference to the so-called buying program, but confined their complaint to the 5.5-cent margin and how they believed it was arrived at. The department took the matter under advisement and for investigation. After some months the jobbers became impatient at the failure of the companies to widen the margin and they repeated their complaint. Finally, in the winter of 1935, they reached high up within the machinery of the

(*Continued on page* 21)

17 Remaining Defendants File Appeals In Madison Oil Case

MADISON, July 25.—Another step towards final settlement of the first Madison oil case was taken last week when a notice of appeal to the circuit court was filed on behalf of the 17 defendants whose motions for a new trial were denied by District Judge Patrick T. Stone on July 19.

The grounds of appeal cites 27 errors. Errors are claimed in the judge's charge to the jury, in government counsel examination of witnesses, in exclusion of evidence concerning the NRA code era, in restricting the defense opening statement to the jury, and in permitting the government "unlawfully to impound" appellants' documents and papers.

The notice of appeal was on behalf of five individuals and 12 corporations. They are:

C. E. Arnott, of New York, Socony-Vacuum Oil Co.; H. T. Ashton, of St. Louis, Lubrite division of Socony-Vacuum; Robert W. McDowell, of Tulsa, Mid-Continent Petroleum Corp.; P. E. Lakin, of St. Louis, Shell Petroleum Corp.; and R. H. McElroy, Jr., of Chicago, Pure Oil Co.

Wadhams Oil Co., Milwaukee; Empire Oil & Refining Co., Bartlesville; Continental Oil Co., Ponca City; Pure Oil Co., Chicago; Shell Petroleum Corp., St. Louis; Socony-Vacuum Oil Co., New York; Sinclair Refining Co., New York; Mid-Continent Petroleum Corp., Tulsa; Phillips Petroleum Co., Bartlesville; Skelly Oil Co., Tulsa; Globe Oil & Refining Co. of Oklahoma, Blackwell; and Globe Oil & Refining Co. of Illinois, Lemont.

A supersedas and appeal bond of $25,000 for all defendants was approved by Judge Stone and filed. The court July 19 had fined each individual $1000, and each corporation $5000 and costs.

The court granted 120 days for preparation of a bill of exceptions. This will be those parts of the trial record to be presented to the circuit court of appeals.

Judge Stone's order on motions after verdict July 19 denied a new trial for the 17 defendants, dismissed the indictment for 11 defendants, and granted a new trial for 18 defendants (N.P.N. July 20, p. 9).

The jury's verdict Jan. 22 held all 46 defendants then remaining in the case "guilty as charged" of anti-trust law violation in a conspiracy to raise midwestern tank car gasoline prices. The indictment was returned in December, 1936 and the trial started Oct. 4, 1937.

Judge Stone had deferred ruling on motions to dismiss the indictment for all defendants before the case went to the jury. Motions to set aside the verdict and for a new trial were filed and argued.

Grounds of Appeal

Grounds of appeal, in brief, are that the:

Court erred in overruling motions on jurisdiction of the western district of Wisconsin as the indictment does not show commission of any overt act in the district; erred in charging jury that sales of gasoline by defendants in Wisconsin court district constituted an overt act.

Court erred in permitting government counsel in examining witnesses "to use unauthenticated alleged transcripts of the witnesses' grand jury testimony . . . . to impeach the testimony or refresh the recollection of those witnesses."

Appellants were deprived of a fair trial by conduct of government counsel in improper questioning of witnesses, improper remarks before the jury, improper remarks not supported by evidence, by "improper, inflammatory, abusive and unsupported statements and appeals to prejudice" in arguments to the jury, stating to jury that certain matters on which there was no evidence in the record were true, and in raising issues in closing jury arguments that were not raised in the indictment.

'Deprived Of Fair Trial'

Appellants were deprived of fair trial through a fundamental misinterpretation and misapplication of section 1 of the Sherman anti-trust law.

Court erred in submitting to the jury issues not raised by the indictment; in ruling acts of the Secretary of the Interior and his subordinates were immaterial; in instructing the jury that there was no evidence of government approval or acquiesence; and in not allowing defendants to show economic history of events leading to conduct of defendants.

Court erred in refusing to instruct jury there was no unreasonable restraint of trade involved in defendants complying with announced purposes of federal administrative officers.

Other Grounds

Court erred:

In not instructing jury that it was necessary to find from all the evidence that defendants entered into an express or implied agreement constituting the alleged conspiracy.

In its selection of charges to the jury, having effect of permitting or compelling the jury to disregard the issue of restraint of interstate commerce.

In charging the jury that indictment allegations of false trade journal prices were immaterial and nonessential allegations, "failure to prove which the jury might disregard."

In charging the jury that indictment allegations of defendants buying gasoline from independent refiners at high, arbitrary and non-competitive prices were immaterial and unessential allegations, "failure to prove which the jury might disregard."

In jury charge that under section 1, Sherman act, any conspiracy or combination with purpose of raising prices by any means whatsoever is illegal.

In jury charge that if a conspiracy was proved consideration could be given statements of co-conspirators against all defendants whether or not defendants had been proved to be participants of a conspiracy.

In restricting scope of defense opening statement to the jury.

In admitting over objection of the appellants oral and documentary evidence that was incompetent and prejudicial.

In allowing government unlawfully to impound appellants' documents and papers, and allowing government to use them.

In denying motions for a directed verdict after the government's case by appellants who then rested their case.

In denying appellants' motions against striking exhibits and testimony submitted at the close of the government's case.

In denying appellants' motions to strike exhibits and testimony, also originally admitted over objections or in the alternative to limit their use, submitted at the close of all evidence.

In denying appellants' motions for a directed verdict submitted at close of the evidence.

In denying appellants' motions for a new trial and to set aside the verdict.

Defense Instructions Refused

Court erred in not admitting certain relevant material and competent exhibits and testimony offered by appellants, in refusing to give jury each appellant's requested instructions limiting use of government evidence, in refusing to give appellants' requested instructions not incorporated in the court's jury charge, and in charging the jury erroneously in other respects and committing other prejudicial errors not specifically mentioned in these grounds of appeal.

Attorneys for all appellants are William J. Donovan, of New York; Herbert H. Thomas, of Madison; and Ralstone R. Irvine, of Washington.

The notice of appeal was signed by each individual appellant and by an official or attorney for each corporate appellant.

New Oil Probe In Pennsylvania Urged By Earle

By Telegraph

HARRISBURG, Pa., July 26. — Pennsylvania's legislature, which convened in special session here last night, has been asked to enact legislation for a new investigation of the oil industry. This was one of the items on Governor Earle's aggenda in calling the special session.

Last year the legislature, by resolution, created an oil-investigating commission and appropriated $50,000 for its work. Judge Ralph E. Smith, Pittsburgh, was appointed chairman. The commission held several hearing. Then its validity was attacked on grounds that the Pennsylvania constitution requires all appropriations to be by legislative acts and not resolutions. The Dauphin County Court enjoined the commission on this ground and its decision was recently upheld by the state supreme court.

Now, a bill has been introduced in the legislature which provides for a new commission, makes an appropriation and validates work of the old commission.

Governor Earle has not indicated whether he will reappoint members of the old commission, assuming that the new legislation is enacted.

Clyde M. Becker Dies

N. P. N. News Bureau

TULSA, July 23. — Clyde M. Becker, consulting geologist, died the night of July 19 at his home in Chickasha. A graduate of the Oklahoma Baptist University, Shawnee, Okla., Becker's study of the Wichita mountains and other geological work of southwestern Oklahoma made him an outstanding authority on that area.

Suppliers Hint Crack-Down On West Coast Cut Prices

N. P. N. News Bureau

LOS ANGELES, July 23. — A definite move by major oil companies to use fair trade laws on the books of three Pacific Coast states, to enforce dealer-maintenance of nominated retail prices was seen in the offing.

One major marketer has notified its dealers by registered mail that its gasolines must be sold at the stipulated and published retail prices. Other suppliers were expected to take similar action or to insist upon more rigid compliance with previous notices to this effect.

Oregon and Washington, in addition to California, have fair trade statutes on their books to provide the machinery for this new drive to eliminate under-canopy price cutting on branded products.

Whether the suppliers will go into court to protect their prices against the "chiselers," remains to be seen. In the past, they have been unwilling to take this step.

General Petroleum Corp. opened the campaign with a letter to each dealer outlining the company's policy on price maintenance. A California dealer received the following:

"To General Petroleum Dealers: Satisfactory sales of our gasoline can only be accomplished by the confident acceptance of our products by the purchasing public and the profitable conduct of our dealers' business. Any unauthorized or unethical reduction in the price of our gasoline has the effect of destroying this public confidence and reducing the dealers' profits.

"The California Fair Trade Act provides that the producer of a commodity which bears his trademark, brand or name may stipulate the price at which such commodity shall be resold. This we have done. Deviation from such stipulated retail price constitutes a violation of the Act. In order that we may comply with the law, insure consumer confidence, and return our dealers a profit, this company's policy requires that our gasolines be sold at the retail prices we have stipulated and published."

Signed by the company, this registered letter to each General Petroleum dealer constitutes official notification of operation under provisions of the fair trade act. It meets, in this respect, with interpretation of the statute by a Los Angeles superior court in a recent fair trade case lost by the Retail Petroleum Dealers Ass'n.

Here the court held there was insufficient evidence that a bonafide legal contract existed between supplier and dealer or that the dealer had been told of actual contracts in existence, or of the supplier's policy with respect to stipulated prices.

Following this case, the R. P. D. A. urged all petroleum suppliers to execute legal contracts with dealers and to place their products definitely under the fair trade act.

This support of dealer groups' efforts to use the fair trade statutes in stabilizing retail gasoline prices on the West Coast, comes at a time when the retail marketing situation in this territory — after more than a year and a half of exceptional stability — has definitely gotten out of hand.

Starting out as "under-canopy" price cutting by dealers seeking to boost their sales at the expense of competitors, the practice of giving away one or two cents has spread up and down the coast and in recent weeks has reached the point were unsolicited discounts to any and all customers has become quite general.

Fuel was added to this fire in recent months when several major marketers increased their margins to operators of key outlets and service station chains. This, in the opinion of marketers, constitutes the most serious threat to price stability on the Pacific Coast today.

A particularly bad spot is in Portland, Ore., where price cutting has become so general that most brands sold through dealers can be purchased at two cents under the posted price.

In Portland, an operator of 23 stations, handling products of a major company, is retailing at two cents under the market — which includes nominal prices posted by other dealers handling the same brand.

The test of whether fair-trade stipulation of retail prices will correct this and other similar conditions, is expected within the next few weeks.

Companies operating their own stations and maintaining posted prices with salaried employes have felt the "bite" of this competition. Their weapon in retaliation may be a general reduction in wholesale and retail.

17.5c Including 9c Tax

PENSACOLA, Fla.—Talk about taxes — dealers here are really working for the tax collectors nowadays, with the dealer price for regular gasoline at 8.5 cents and the federal, state and city gasoline taxes totaling 9 cents, or 0.5 cent more than the gasoline itself.

Wisconsin Jobbers Win Inspection Fee Cut

MILWAUKEE, July 25.—Wisconsin marketers will pay 0.5-cent less for each barrel of gasoline inspected by the state after Aug. 1, thanks to efforts of the Wisconsin Petroleum Association.

Reduction of the gasoline inspection fee, from the present 2 cents a 50-gallon barrel rate, was one of the planks in the association's platform, and Gov. Phil LaFollette recently signed the order making the new rate 1.5 cents a barrel.

The savings to the industry in Wisconsin will be about $100,000 annually, Roy L. Brecke, association secretary, estimates.

The inspection fee rate was discussed during a recent conference in Madison attended by the governor, state tax and inspection officials, and Brecke.

Fees were found to produce more revenue than was required to operate the inspection department. Wisconsin's law provides that the department shall be self-sustaining. A new order was then written by George Keith, supervisor of the inspection and enforcement department.

The latest previous reduction was in 1929 when the fee was reduced 0.5-cent to the 2 cent rate. Brecke then was in charge of the state oil inspection department.

Asphalt Meeting In February

NEW YORK, July 26. — The 12th national asphalt conference will be held Feb. 20 to 24 at the Biltmore Hotel, Los Angeles, under the auspices of The Asphalt Institute. J. E. Pennybacker, New York, managing director of the Institute, is general chairman of the conference, and Daniel B. Miller, managing engineer of the Pacific Coast division, is co-chairman.

J. S. Helm, Standard Oil Co. of New Jersey, president of the Institute, will outline world progress in highways as reported to the 8th International Road Congress recently held at The Hague, and which he attended.

New York Kills Tax Earmarking

By Teletype
N. P. N. News Bureau

NEW YORK, July 26.—With former Governor Alfred E. Smith, a delegate, leading the fight against a proposal to limit diversion of gasoline tax to one-half of the tax revenue under the state constitution, the New York constitutional convention early today killed the proposed amendment by a vote of 85 to 57.

The Feinberg bill proposed to make mandatory under the state's constitution the use of the first two cents of the state gasoline tax, and all automobile license revenue for highway purposes only. Present New York tax is 4 cents per gallon, of which the third and fourth cents are "emergency" levies.

Smith argued that the proposal would bind the hands of the state legislature and the governor to appropriate half of the gasoline tax revenue, but never less than 2 cents, plus the license revenues for highway purposes, regardless of the needs of other branches of the state government.

Standard Pipe Line Co. Valued By ICC

N. P. N. News Bureau

WASHINGTON, July 25. — Tentative valuation of carrier-owned-and-used properties of Standard Pipe Line Co., Inc., located in Arkansas and Louisiana, has been set by Interstate Commerce Commission's valuation bureau at $17,000,000, as of Dec. 31, 1934.

According to the ICC report, the company's lines "form an integral part of the Standard Oil Co. system. . . It serves the refinery of the Standard Oil Co. of Louisiana. . . Its pipe line connects with the pipe line of the Oklahoma Pipe Line Co. . . . at the Oklahoma-Arkansas state line . . . and with the pipe line of the Humble Pipe Line Co. . . . at the Texas-Louisiana state line."

Dividends have been declared by the company during the 10 years prior to valuation date (except 1928 and 1930) averaging 30.3 per cent per year on the $25,000,000 capital stock outstanding, ICC reports.

Recycling Gas is Urged as Conservation Measure

Economic Advantages Of Returning Gas To Sands Is Pointed Out To Bar Group

N. P. N. News Bureau

CLEVELAND, July 26.—Distinct economic advantages are possible to oil companies, as well as a furtherance ot conservation, through the repressuring of oil producing structures with the gas produced with the oil, J. H. Dunn of Dallas, production engineer with the Lone Star Gas Co., told the Section of Mineral Law of the American Bar Assn. here today.

Dunn was one of two speakers on the general subject assigned this meeting, "Recycling Gas, Repressuring Oil Sands and Storing Gas in Depleted Fields, as Conservation Measures."

The other speaker was C. C. Small of Amarillo, Texas, member of the Texas Senate, who discussed legal aspects of the subject, Dunn looking at it from the engineer's viewpoint. Senator Small's conclusion was that existing regulations and the litigation to which these regulations have been subjected, provide the necessary authority for the state to enforce this new phase of the conservation movement—the return of natural gas to the sand where economic use cannot be made of it—as it is produced.

Included with Dunn's paper was the presentation of data as to the cost of compression for injection of gas for various types of operating wells, the cost figure being represented in cents per barrel of oil produced, for a five-year, ten-year and 15-year life of the property, and for joint repressuring operations and where the individual operator carried on the repressuring operation alone. These calculations showed compression costs for injection of the gas produced with the oil with a wide variance from around three cents per barrel of oil to as high as 17 cents. The operations on which the data were based were said to be typical of many producing fields.

Referring to these calculations, Dunn stated that it was believed that the cost of returning the gas to the underground reservoir for many fields operated on a scientific basis would not exceed on the average five cents per barrel of oil produced.

"Compare that cost," he said, "or even a much greater cost, with the value of an increased recovery of two barrels for one, or with present lifting costs in these fields which reach figures as high as 35 cents a barrel. Then consider the value of and the conservation represented by the saving of the enormous volumes of gas that heretofore have been wasted.

"There is no better place to store gas for future consumption from the standpoint of conservation than in the same reservoir that originally held the gas."

Dunn discussed the various types of gas conservation measures as (1) the recycling of gas in gas producing formations, (2) the repressuring of and maintenance of pressure in oil sands and (3) the storage of gas in depleted fields.

The recycling of gas in gas producing formations, he said, which was a process of recent development, made possible the recovery of hydrocarbon liquids that otherwise might be lost through condensation in the reservoir during the depletion of the reservoir pressure.

The repressuring of, or pressure maintenance in, oil sands he said increased total recoveries of oil and in addition provided for saving gas for ultimate commercial consumption.

Gas storage in depleted fields he described as a process that might be used to provide a means for saving for ultimate consumption gas that would otherwise be wasted and also offered the opportunity for the recovery of a portion of the hydrocarbon liquids that would otherwise remain in the reservoir at the time of abandonment.

Practicable Conservation

In discussing the results obtainable from the injection of gas into producing horizons under various conditions, Dunn defined "practicable conservation" as the operation of producing wells in accordance with proven and practicable methods which will enable the operator to recover profitably the greatest amount of recoverable oil and gas.

Dunn said that one reason for the slowness of the oil companies in adopting into operating practice the methods now known to make greater use of natural gas in the efficient production of oil was to be found in such factors as diversity of property ownership, for example, which were beyond the oil company's control.

Proration and the restricted production of oil have been largely responsible for the progress that has been made toward efficient utilization of reservoir energy, he stated. "The amount of oil produced under proration, however, has been determined largely by quantities necessary for the stabilization of production and has had little or no relation to the scientific production rates which would provide for the greatest ultimate recoveries from the separate reservoirs," he stated.

"It is an open question whether proration or restricted production will be applied for conservation's sake alone when the market is capable of absorbing a greater proportion of the potential production than is warranted by proper rates of production."

For each reservoir, Dunn stated, it is possible to determine the most efficient rate of production, which, together with proper well spacing and operating procedure, will provide the practicable means for recovering the greatest ultimate quantity of oil. The problem then arises, he said, as to how this most efficient rate of production can be made to conform to the actual demand for the oil.

"It can be made to conform to the market demand only so long as efficient utilization of reservoir energy can be obtained while the oil is being produced," he said. "An operating procedure which includes the return of the gas produced with the oil to the producing formation offers the best opportunity of realizing this ideal condition."

Greater Oil Recovery

Under all conditions of production, he said, the return of gas to the formation would pay large dividends in increased oil recovery over that which could be expected under the same conditions without return of the gas.

Discussing the recycling phase of gas conservation, where the gas is produced, expanded, separated from the condensed liquids, recompressed and returned to the reservoir, Dunn said that the relation of recycling gas in gas formations to ultimate recoveries and conservation arises from the tendency of the sands to absorb liquids and also from the impossibility of obtaining full recovery of the liquids if they are condensed in the reservoir.

"The indications are that in certain fields there will be a rather broad application of the process of recycling gas in order to recover appreciable quantities of these hydrocarbon liquids," stated Dunn. "The operation of this process is economically feasible as long as prices and production rates can be maintained at the necessary levels." There are several small recycling plants in operation and others are under construction, he said.

Referring to the storage of gas that would otherwise have been wasted in some localities in Canada, California, the eastern fields and to some extent in the Mid-Continent, Dunn stated this was highly desirable as long as the industry continues to waste gas in connection with the production of oil. "If, however, the definition of conservation includes oil as well as gas, then the gas should be stored, not in remote and depleted reservoirs, but in the same reservoirs from which it has been produced," he said.

While there are a few outstanding examples of increased recovery efficiencies that have been brought about by repressuring and by pressure maintenance operations in oil producing formations, the application of these processes as yet has been made to only a very limited extent, Dunn stated.

"It is generally conceded that in most instances only 25 to 35 per cent of the total reservoir content of oil has been recovered by customary methods of natural flow and pumping," he stated. "It is, likewise, generally conceded that this recovery percentage can be increased to more than 70 or even as much as 80 per cent of the reservoir content by intelligent repressuring and by the maintenance of reservoir pressures.

"In addition to the possibilities for the increased recoveries of oil through repressuring and pressure maintenance, the gas used for this purpose can be made available for commercial consumption after the production of the oil."

Legal Aspects Discussed

In discussing the legal aspects of the subject of gas conservation to increase oil recovery, Senator Small stated it as his opinion that compulsory pressure maintenance as ap-

(*Continued on page* 21)

Summers Suggests Oil Control Based On Correlative Rights

(*Continued from page 9*)

ple way of stating that the privileges of each landowner in a common source of supply of oil and gas are limited by duties to other landowners not to injure the oil or gas reservoir or to take an undue proportion of the oil or gas obtainable from it. In common law this is referred to as the nuisance principle.

He pointed out that early decisions in cases concerning the right to produce oil had held that a landowner was legally privileged to take oil and gas subject only to limitations on committing surface nuisances. The tenor of these decisions, he stated, had been to the enforcement of a policy of oil production, rather than oil conservation, and that out of this developed the so-called law of capture.

Origin of Principle

The controversy between the policy of production and the policy of conservation started in the 1890's, Summers said, and the courts began to give recognition to the peculiar physical facts concerning oil and gas. A U. S. Supreme Court decision held that all landowners in a common source of supply of oil and gas are equally privileged to take from it, but that an unlimited exercise of such privileges by one "may result in an undue proportion being attributed to one of the possessors of the right, to the detriment of others, or by waste of one or more, to the annihilation of the rights of the remainder." This was a statement of the correlative rights of landowners in an oil or gas pool by the highest judicial authority, stated Summers.

Events have so transpired since this decision, he said, that landowners and producers, ignoring the public's interests, seemingly preferred the practice of self-help to secure their proportion of the yield, rather than to resort to litigation for the protection of their rights against others. Thus, he said, the doctrine of capture prevailed as a matter of operating practice and the courts relied on the police power of the state to prevent waste, for the protection of the public interest.

"The physical facts of oil and gas are now known, upon which it may be determined what acts may cause injury to the reservoir and upon which each landowner's due proportion of the oil or gas may be reasonably estimated," Summers stated.

"A proper understanding and use of this knowledge in connection with the recognized doctrine of correlative rights, actually applies the common law principle of nuisance to the production of oil and gas. If this theory is fully recognized and applied by the courts in supporting the validity of conservation legislation and the orders of administrative agencies, the gap between desirable social policy and technical legal rules is narrowed and the realization of such policy may be more easily accomplished.

Not Dependent On Waste

"A legislative enactment prohibiting the taking of an undue proportion, or injury to the oil and gas reservoir, and authorizing the administrative agency to make regulations for the drilling and operation of wells to effectuate these purposes, is merely declaratory of existing common law property rights and cannot be declared unconstitutional as a deprivation of property rights without due process of law, and support of the constitutionality of such legislation need not be dependent upon the proof of waste."

Summers said that, in Arkansas, California, Illinois, Kansas, Mississippi and perhaps others, new and further conservation legislation is being considered. He referred to the measure being prepared by the Illinois-Indiana Petroleum Assn. to submit to the Illinois legislature, interest in such legislation being accentuated by the new fields in that state.

"This act," he said, "as most modern conservation legislation, with the exception of a recent Texas statute, and possibly the California oil-gas ratio statute, has been framed solely upon a waste prevention theory. These statutes merely define and prohibit waste and provide for the regulation of the drilling for and production of oil and gas for the avowed purpose of securing the greatest ultimate recovery for the protection of public interests, but assure the owner that, despite these regulations, he will be given the opportunity to produce his just and equitable share."

Two New Refineries Planned For Canada ByMcColl-Frontenac

TORONTO, July 23.—McColl-Frontenac Oil Co., Ltd., now controlled by The Texas Co., is considering entry into the Turner Valley field on a large-scale, obtaining its own production and building a refinery, according to J. M. Pritchard, vice-president.

Pritchard said the company was planning to enter the field and obtain its own production to "make the company self-sustaining." This would be followed by construction of a 2000-barrel refinery at Calgary, on which work would be started next year.

He also disclosed tentative plans for a million-dollar expansion program in Saskatchewan, with the possibility of erecting a refinery at Regina. He was optimistic over the improved outlook for the Canadian West this year, following good crops after several years of drought.

McColl-Frontenac now has a 17,000-barrel refinery at Montreal and another 5000-barrel plant at Toronto.

BritishAmerican Oil Co., Ltd., and Imperial Oil Co., Ltd., (Standard of New Jersey) are already operating in Turner Valley on a large scale.

Crude Oil Stocks Drop Another Million

N. P. N. News Bureau

WASHINGTON, July 25. — Stocks of refinable crude petroleum on July 16 were 289,312,000 barrels, a decrease of 1,157,000 barrels during the week, according to Bureau of Mines figures.

It was the thirteenth consecutive weekly decrease in crude stocks. When the decline began, on April 23, stocks stood at 307,654,000 barrels. The July 16 figure was the lowest stocks have been since February 27, 1937, when they were 288,121,000 barrels.

Stocks, by grade or origin, showing recent changes, follow:

(*Thousands of Barrels*)

Grade or Origin	July 2	July 9	July 16	Chng. from July 9
Pennsylvania grade	5,853	5,869	5,906	+ 37
Other Appalachian	1,467	1,431	1,372	— 59
Lima- Michigan	1,421	1,428	1,370	— 58
Illinois-S. W. Indiana	10,362	10,326	10,468	+ 142
Arkansas	3,243	3,101	2,969	— 132
Kansas	6,565	6,298	6,387	+ 89
Louisiana	13,684	13,889	14,009	+ 120
Northern	6,650	6,344	6,263	— 81
Gulf Coast	7,034	7,545	7,746	+ 201
New Mexico	8,396	8,142	8,046	— 96
Oklahoma	84,232	83,720	82,696	—1,024
Texas	96,615	96,244	96,240	— 4
East Texas	23,964	23,600	23,164	— 436
West Texas	19,436	19,366	19,205	— 161
Gulf Coast	19,071	18,936	19,177	+ 241
Other Texas	34,144	34,342	34,694	+ 352
Rocky Mountain	23,538	23,326	23,138	— 188
California	33,085	33,039	33,067	+ 28
Foreign	3,205	3,656	3,644	— 12
Total U. S. refinable	291,666	290,469	289,312	—1,157
Heavy in California	17,521	17,718	17,763	+ 45

Bailey V. Emery Dies

N. P. N. News Bureau

TULSA, July 21. — Bailey V. Emery, 44, secretary-treasurer of the Dixie Oil & Gas Co., died July 20 in a Tulsa hospital from a heart ailment.

Vest-Pocket 'Poly' Units Succeed In Michigan

N. P. N. News Bureau

CLEVELAND, July 23.—"Vest pocket" catalytic polymerization units at Leonard Refineries Inc. and at McClanahan Refineries, Inc., at Alma and St. Louis, Mich., respectively, are solving the problems of increased gasoline yields and higher octane number fuels without additives, information obtained from those refiners shows.

Faced with these problems in increasing degree, these refiners constructed these Dubbs units, far smaller than any yet operated commercially. The McClanahan unit processes 270,000 cu. ft. of stabilizer tops from a 1100-barrel reforming unit, to produce 2600-2800 gallons per day of 83-85 octane number blending naphtha with a blending octane value of 100 or higher, increasing the gasoline yield by seven per cent.

The Leonard unit started on June 22 and is still running, having shut down only a few minutes to make some quick adjustments on the compressor. It handles 150,000-175,000 cu. ft. per day of stabilizer tops from a 2-coil cracking unit, producing 1500 barrels per day of polymer gasoline, and increasing the total yield by about 3¼ per cent. Addition of this fluid to the plant's production has eliminated the use of benzol as a blending agent.

Oil Recovery Is Increased By Gas Recycling

(*Continued from page* 19)

plied to oil fields does not offend the rule that the exercise of police power by the state must be limited to just and reasonable bounds, with no unnecessary interference with the right of the individual to enjoy and use his property in ways as to him seems fit. Earlier in his address he had stated that he believed existing regulations under the police power of the state were sufficient for their application to gas conservation.

"Logical minds can reach but one conclusion as to the merits of pressure maintenance in the ordinary oil field," he concluded. "Millions of barrels of oil have been recovered and utilized, and vast quantities of both oil and gas have been restored as a part of our underground petroleum supply as a result of pressure restoration and pressure maintenance.

"These resources were recovered from oil producing formations or were restored therein through repressuring and pressure maintenance. Conditions may be found where pressure maintenance would not be practical, yet the striking examples enumerated by Mr. Dunn show such a variation as to the depths of the wells, as to the weight of the pressure against which gas was introduced, and as to the extent depletion had gone before restoration of pressure was attempted as to leave no doubt of the fact that the operation is practical and sound in a vast majority of oil fields.

"From the standpoint of ultimate recovery of oil, repressuring and pressure maintenance of oil sands with the casinghead gas has long since passed the experimental stage. It is no longer considered venturesome from a financial standpoint, but on the other hand it is shown to be perfectly sound and remunerative. It cannot be condemned as an unreasonable requirement on account of the initial cost, because the tables prepared by Mr. Dunn, which from my investigation are conservative, show the per barrel cost to be of little significance.

"In conclusion we assert that the primary basis for police regulation has been met in that pressure maintenance, the restoration of pressure, the recycling and the storing of gas, cannot be condemned as unreasonable requirements and cannot be termed arbitrary or capricious in that they pay dividends in greatly increased oil and gas recovery, in the elimination of lifting cost in oil production, and also in the fact that when the oil field and distillate fields are depleted, the gas is left for light and fuel or other uses."

R. E. Hardwicke Elected Vice-Chairman

CLEVELAND, July 26.—At the meeting of the Section of Mineral Law of the American Bar Assn. here today, Stanley B. Houck, attorney of Minneapolis, was elected chairman for the coming year, succeeding James L. Shepherd, Jr., of Baker, Botts, Andrews & Wharton, Houston.

Houck is an attorney who has specialized in coal matters principally.

Robert E. Hardwicke, of Fort Worth, who has been active in the oil conservation movement in Texas, was elected vice-chairman. He has been a member of the council of the section. Peter Q. Neice of Washington continues as secretary of the section.

New Gasoline Pump Computer Offered

NEW YORK, July 25.—A new type of computer mechanism for use in gasoline dispensing pumps has been developed by the Neptune Meter Co., which will be offered to all pump manufacturers operating under a Wayne license, it was learned here today.

The new mechanism is being manufactured by Neptune under a license and agreement with Wayne Pump Co., Fort Wayne, Ind., under patent applications owned by the Valley Equipment Corp., and under which Neptune is the licensee. It is understood that development work has been under way for two years on this unit.

According to the Neptune company, this new computing mechanism is readily interchangeable with other direct reading types now in service.

Neptune recently announced the purchase of all corporate stock of Aqua Systems, Inc., which is being run under the supervision of R. K. Blanchard as a direct subsidiary of Neptune. Plans are being completed to handle sales and service through Neptune's branch office.

THE SCORE
In the First Madison Oil Case

(*Continued from page* 16)

Democratic party and pulled a wire that rang a loud bell in the inner offices of the White House itself. Then the Department of Justice jumped.

By reason of that new energy there was "discovered" this "hideous conspiracy" to save the whole effort of the administration and the code authorities and the price of crude. Also indictments were brought down on the jobber's behalf for alleged conspiring to agree upon terms of an alleged uniform contract. But that case was settled by agreement with the Department and the entering of pleas of nolo contendere. The details in that case are kept in a closed book which may be opened during the trial of the companies that did not so plead this fall.

The jobber still has his 5.5-cent margin.

The administration still has its fair price for crude oil.

But now the Independent refiner is rapidly going out of the picture because all this last winter the price of refinery products has been ruinously low. Crude prices are threatened. Independent refiners have appealed many times to the Department of Justice to approve some kind of a sales agency through which they could get orderly marketing and fair prices that would protect the present prices for crude oil. But the department has turned a rather deaf ear to these pleas, in fact, it asked these refiners who are the last few survivors of a big army that once provided the chief competition to the major oil companies, to say why they should be kept alive anyway.

And the government has called another grand jury investigation and open market buyers complain of "the squeeze."

It is all most confusing.

What does this administration want anyway of the oil industry?

Does it want competition in the manufacture of refinery products?

Does it want the small business man to help distribute those products?

Does it want to see present prices for crude oil continued or is it now willing to have those prices drop to a parity with gasoline prices?

Whose word in government can the oil industry take? What good is that word, no matter who gives it?

And now this administration at Washington, peeved because it lost part of a case that it mishandled terribly and which, according to all the rules of fair play it never should have brought anyway, would rebuke the judge who ruled against it. The administration would go and hunt out a judge whose rulings against the defendants it could depend upon, as per the New Deal's ideas of "controlled justice".

Surely the honor and honesty and decency and fair play and law abidance of this administration are at issue in these oil cases, just as they seem to be at issue in many other relationships between most business and this Federal government.

Hugoton Gas Proration Recommended

N. P. N. News Bureau

TULSA, July 25. — Recommendation that gas production in the Hugoton field of southwestern Kansas be prorated was made at a Kansas Corporation Commission hearing at Hugoton last week. The recommendation was made by both independent and major companies.

J. H. Page, director of the gas section of the state conservation division, testified that of 265 wells in the six-county area, 28 were without pipeline connections. He said that ratable taking is practiced by the purchasing companies as to wells on their own lines but not as between pipeline companies. Of the 13 trillion cubic feet of gas reserves estimated as originally existing in the 2,380,000 acre area, he said that approximately 1 per cent had been withdrawn.

Kansas Chairman Charges Compact Is 'Ineffective'

By Teletype
N. P. N. News Bureau

TULSA, July 26.—An allowable crude oil production for August of 165,500 barrels daily was set by the Kansas Corporation Commission in an order issued late July 25. This is an increase of 500 barrels daily over the July allowable, and 3800 barrels daily under the Bureau of Mines' estimate for August demand for Kansas crude. The bureau had set the estimate at 169,300 barrels daily.

Chairman E. R. Sloan of the commission opened the hearing by reading a prepared statement in which he stated that to continue to operate under an "ineffective" compact between producing states, leaving purchasers operating in several states "free to prorate" their purchases at will is to invite federal control. Sloan said he had found that the buyers who operated in several states went where they could get the most for their money.

Pipeline Proration Continues

Pipeline proration in the southern Oklahoma fields will continue through August, it was indicated July 23 when Carter Oil Co. announced it was switching Aug. 1 from a percentage of allowable production to a flat 5 barrels per well per day basis.

The company had been taking 80 per cent of the allowable production in specific areas in this part of the state. This amounted to approximately 8500 barrels daily. Under the maximum 5 barrels per well basis, the takings will be cut about 1700 barrels daily.

It is pointed out, however, that, while there will be an over all reduction in pipeline takings, actually the change will be beneficial to more producers than it will affect adversely. That is due to the fact that, under the 80 per cent plan, a large number of wells were cut to under 5 barrels per day production. Now those wells can be stepped up to the 5 barrels maximum, while other wells which had been produced at above that total will be cut back. Carter's announcement stated:

"Due to further loss of market occasioned by contamination of our crude stream through continued inclusion of excessive composite receipts of inferior quality crudes from specific areas in southern Oklahoma, this company regrets the necessity of further limiting its overall takings of such crudes and announces that, effective Aug. 1 and thereafter until further notice, it will be obliged to limit its taking from such areas to a maximum of 5 barrels per well per day, on a lease basis from all leases from which it is at present taking oil. The areas to which this applies are as follows: Oscar, Seay, Spring, Hewitt, Tatums, Tussy, North Tussy, Wildcat Jim, Fox-Milroy (shallow), Graham, Cox, Scholem-Alechem and Wheeler."

Oklahoma operators are looking forward, with considerable interest meanwhile, to the market demand hearing before the Oklahoma Corporation Commission July 28, when nominations for August will be made. This increased interest has been created as a result of an order issued by two of the commissioners, A. S. J. Shaw and Jack Walton, reinstating all underproduction on wells and leases in the Wilcox zone of the Oklahoma City field and giving the operators until Sept. 1 to make up as much of that underage as they can. The order is retroactive to January, 1937, on one-well leases, and to Aug. 1, 1937, on other leases.

Underage Is Problem

It is estimated that this underage amounts to approximately 3,000,000 barrels; but many operators doubt that amount of oil can be produced before Sept. 1 in addition to daily allowables. Reports are that about 10,000 barrels daily is the amount now being produced under the order, which was issued July 16, a few days after Walton's unsuccessful candidacy for governor.

In some quarters it is indicated operators will ask the commission next week to decrease the percentage allowable for August so the underage can be produced and run by pipelines. There also is likely to be considerable re-argument that both the underage and overage in the field be wiped out entirely in order to stabilize the situation and re-establish equity between the wells and leases.

The advisory committee and the corporation commission personnel will attempt to work together toward a simplification of rules and regulations which have been issued under the present conservation law. There have been so many exceptions to the rules, it is pointed out, that many operators have found the whole set-up rather cumbersome and have experienced some difficulty in operating their properties efficiently and still abiding by the rules.

The committee probably will avail itself of his counsel and the data which Dr. Stephenson collected in preparation of his paper on producing costs of closely spaced wells in Kansas which he delivered before the mid-year meeting of the API in Wichita last May.

That Kansas is considering a revision of general rules governing the state's oil industry is indicated by an announcement that a special advisory committee to the Kansas Corporation Committee is to confer with Dr. E. A. Stephenson, head of the petroleum engineering department of the University of Kansas . H. A. Meyer, managing director of the Kansas Independent Oil & Gas Assn., has appointed H. K. Beardmore, T. C. Johnson, J. A. Aylward, A. S. Ritchie and J. A. Vickers to the committee.

The four major company representatives are:

D. P. Howard, Cities Service Oil Co.; H. E. Zoller, Shell Petroleum Corp.; D. R. McKeithan, Phillips Petroleum Co.; and R. L. Marek, Stanolind Crude Oil Purchasing Co.

The committee met July 25 at Wichita for organization. Dr. Stephenson was named chairman, and H. A. Meyers, of the Kansas Independent Oil & Gas Assn., was chosen secretary.

Against Withdrawal

The commission has recommended to Gov. Walter A. Huxman, meanwhile, that Kansas remain a member of the Interstate Oil Compact. The governor had asked the commission's opinion as to possible withdrawal, stating that the group was "without power" but sat only as an advisory body. The commission's letter to the governor said there were two courses to be followed: "First, let the producer fight for his market with such aid as the state may be able to give him, without governmental authority, and second, that the power of government be invoked to compel a reasonable allocation of the market demand among petroleum-producing states."

The two courses named in the letter were taken in some quarters as indicating that the commission favored working on the market problem at home first, but if that failed to get results the matter should be taken to fededal authorities at Washington. It will be recalled that Governor Huxman already has made one trip to Washington to call on the Bureau of Mines.

All of which means that when the Interstate Oil Compact Commission meets in Colorado Springs, Col., July 29 and 30, the "main business" is likely to be conducted by the Kansas delegation, since Col. Ernest O. Thompson, chairman, has been too busy with campaigning for the governorship of Texas to give a great deal of attention to preparation of a program.

Absorption Plant Opens In Rio Bravo

N. P. N. News Bureau

LOS ANGELES, July 23. — To handle the gas output from wells recently completed in the deep-sand Rio Bravo field, in the San Joaquin Valley, Union Oil Co. has put in operation a new absorption plant capable of treating 20 million cubic feet of gas daily.

Representing a capital investment of about $500,000, the single-unit plant is of the latest type design and was built jointly by Union and Superior Oil Co., although it will be operated by Union.

It is estimated that wells already drilled are capable of running the plant to capacity, but due to curtailment of crude production, the plant is now treating only 5,000,000 cubic feet of gas, for a yield of 3000 gallons of natural gasoline, daily.

The dry gas is not being sold at present, but is being used in the field for drilling purposes. The natural gasoline is trucked to Union's Maltha refinery, near Bakersfield.

With the large amount of available fuel, direct-fired heaters, instead of steam, are used in the plant and all low-pressure gas is compressed by two of the latest angle-type compressors and treated at 500 pounds pressure. When gas is marketed, it will be available at this pressure.

Provisions were made for expansion of the plant to three times its present size, as future demand warrants.

Frick-Reid Moves To Tulsa

TULSA, July 26.—John L. Shakely, vice president and general manager of western operations for Frick-Reid Supply Co., has been named president of the company, succeeding W. M. Patterson. Main offices of the company are being moved from Pittsburgh to Tulsa, a division office at Pittsburgh will be maintained. Robert McCoy, Jr., will succeed Shakely. Harold Wilson, assistant sales manager in the Dallas office, will be brought to Tulsa as sales manager.

TPD Speeds Up Contract Awards

N. P. N. News Bureau

WASHINGTON, July 25. — "Riders" on bid forms on federal gasoline and fuel oil contracts are from now on "taboo", Treasury Procurement Division has announced.

Hereafter any qualifications on bids will have to be stated in letters, attached to the bid forms, but not written in, it is said.

The new regulations, set forth in all gasoline and fuel oil bids sent out for the fourth 1938 quarter, are to enable the recently created fuel division of TPD to speed up its work so that successful bidders may be notified at least a month in advance of the time their contracts begin, the TPD said.

"Should any bidder," the new paragraph reads, "elect to stipulate minimum quantities per delivery, or other special conditions which may modify the bid, same shall be submitted in the form of a letter attached to the front of each copy of the invitation to bid, U. S. standard form 33, (revised) and *NOT* on the price bidding sheets of schedule 2 or any other place in the bid. Failure of any bidder to comply with this stipulation will be sufficient cause for rejection of his bid."

Division officals explain that typed-in qualifications cause delay in considering the bids, and point out that some bidders type in modifications in type similar to that used in making out the bid forms, with the result that they are easily overlooked.

Since establishment of the Fuel Division within the TPD, an effort has been made to "push forward" the awards so that at least a month will expire between the awards and the beginning of the contract.

This year the opening dates have been moved ahead, particularly for the Western regions, which it takes longer for official notification to reach, with the result that the opening dates are:

Region 1, Aug. 1; Region 2, Aug. 3; Region 3, Aug. 5; Region 4, Aug. 1; Region 5, Aug. 3, and Region 6, Aug. 5.

Similarly, the fuel oil bid openings have been moved forward, as follows: Region 1, Aug. 12; Region 2, Aug. 12; Region 3, Aug. 10; Region 4, Aug. 10; Region 5, Aug. 8; Region 6, Aug. 8.

DAILY AVERAGE PRODUCTION IMPORTANT DISTRICTS
American Petroleum Inst. Figures

	Week Ended July 23 Barrels	Week Ended July 16 Barrels
Oklahoma City	104,450	105,000
Total Okla.	434,300	442,450
East Texas	438,900	438,500
Total Texas	1,394,800	1,378,200
Kansas	157,700	153,700
Total La.	265,300	263,850
California	663,300	669,400
E. of Rockies	2,685,750	2,673,700
Total U. S.	3,349,050	3,343,100
Crude imports	73,000	57,860
Tot. new sup'ly	3,422,050	3,400,960

Fuel Oil Specifications Are Unchanged

N. P. N. News Bureau

WASHINGTON, July 25. — Invitations for bids to supply federal government agencies with fuel oil during the last quarter of 1938 are going out from Treasury Procurement Division this week—and the specifications for the oil the government will buy are the "VV-O-326" specifications against which there have been a number of informal protests.

Gasoline Stocks Sharply Cut, Off 18% Since Peak In March

N. P. N. News Bureau

NEW YORK, July 26.—Gasoline stocks continued their downward trend in the week ended July 23, the U. S. total dropping 2,355,000 barrels to 76,366,000 barrels, according to the American Petroleum Institute's estimate today.

Crude runs for the country as a whole were down 15,000 barrels on daily average, the Institute's report showed, and gas and fuel oil stocks continued to climb.

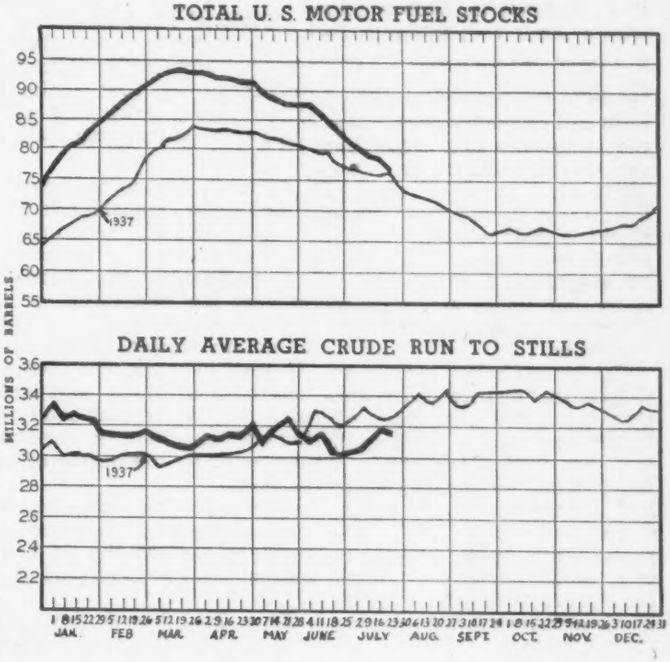
The cut in gasoline stocks last week carried inventories to below the Jan. 1, 1938 level, and down 16,826,000 barrels, or 18.1 per cent, from the 1938 peak of 93,192,000 barrels reported by the Institute as of March 19, 1938.

Standing at 76,366,000 barrels on July 23, stocks were only 4,649,000 barrels above the stocks level on July 23, 1937.

Gasoline inventories were reduced in all districts except the Appalachian district. East Coast stocks showed the largest drop, 725,000 barrels. California inventories were down 548,000 barrels. There were inventory cuts of more than 200,000 barrels in the Oklahoma-Kansas-Missouri and Texas-Gulf districts, and of more than 100,000 barrels in the Indiana-Illinois-Kentucky and Louisiana-Gulf districts.

Gas and fuel oil stocks increased 973,000 barrels, hitting 143,041,000 barrels on July 23. More than half of this rise was due to a 501,000-barrels increase in stocks of heavy California oils.

Stocks of heavy fuels for the country as a whole increased 594,000 barrels, while stocks of gas oils and distillates increased 379,000 barrels.



CURRENT REFINERY OPERATIONS

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended July 23	Daily Average Crude to Stills (Barrels) Week Ended July 16	Per Cent of Reporting Capacity Operated Week Ended July 23	Per Cent of Reporting Capacity Operated Week Ended July 16	Stocks (Thousands of Barrels) Total Finished and Unfinished Motor Fuel* Week Ended July 23	Stocks (Thousands of Barrels) Total Finished and Unfinished Motor Fuel* Week Ended July 16	Stocks of Gas and Fuel Oil Gas Oil and Distillates Week Ended July 23	Stocks of Gas and Fuel Oil Gas Oil and Distillates Week Ended July 16	Stocks of Gas and Fuel Oil Residual Fuel Oil Week Ended July 23	Stocks of Gas and Fuel Oil Residual Fuel Oil Week Ended July 16	Total Week Ended July 23	Total Week Ended July 16
East Coast	100.0	488,000	478,000	72.9	71.4	21,442	22,167	5,560	5,373	7,300	7,632	12,860	13,005
Appalachian	88.4	103,000	107,000	79.8	82.9	3,218	3,198	243	238	921	942	1,164	1,150
Ind., Ill., Ky.	92.4	424,000	410,000	86.7	83.8	12,653	12,777	3,206	3,160	5,959	5,950	9,165	9,110
Okla., Kans., Mo.	84.7	279,000	290,000	72.8	75.7	6,494	6,731	1,055	1,065	3,200	3,140	4,255	4,205
Inland Texas	56.6	149,000	139,000	74.1	69.2	2,095	2,152	380	397	1,452	1,379	1,832	1,776
Texas Gulf	95.7	725,000	721,000	91.0	90.5	9,189	9,418	4,605	4,417	7,739	7,675	12,344	12,092
La. Gulf	96.6	113,000	131,000	67.3	78.0	2,570	2,757	1,250	1,285	2,162	1,963	3,412	3,248
No. La., Ark.	63.7	41,000	46,000	70.7	79.3	528	572	270	261	526	525	796	786
Rocky Mt.	69.7	47,000	52,000	75.8	83.9	1,756	1,850	137	140	769	769	906	909
California	90.9	503,000	512,000	67.4	68.6	12,561	13,109	9,609	9,610	83,798	83,297	93,407	92,907
Total Reporting	89.0	2,872,000	2,886,000	77.6	78.0	72,506	74,731	26,315	25,946	113,826	113,242	140,141	139,188
Estimated U. S. Total (Bur. of Mines Basis)		3,180,000	3,195,000			76,366	78,721	26,945	26,566	116,096	115,502	143,041	142,068

*Includes stocks at refineries, in bulk terminals, pipe lines and in transit.

Indiana Standard Wins Fight Against New Jersey Company

CHICAGO, July 25. — The right of the Standard Oil Co. of Indiana to the trademark "SO" or its derivations was upheld by the federal circuit court of appeals last week at St. Louis in an opinion in the Esso, Inc., case.

The injunction granted in the federal district court last year against Esso, Inc., subsidiary of the Standard Oil Co. of New Jersey marketing "Esso" gasoline in St. Louis, was upheld.

The only Standard Oil reputation known in the 14 states in the case (Indiana Standard's midwestern marketing territory) is the Indiana Standard, the circuit court's opinion held.

Dissolution Decree Cited

The district court had found as a fact that the Jersey company's stock ownership in Indiana Standard, prior to the 1911 dissolution, gave Jersey no rights in the Indiana company's good will or trade marks. Also, that since the 1911 dissolution various Standard Oil companies had acquired common law rights to the "SO" trademarks in their respective states, and have competed with each other without limitation to locality but under trade names not including "Standard" or similar words.

The circuit court opinion reviewed the district court decision then held that "the circumstances which distinguish this case from many others is the fact that defendant's (Esso, Inc.) parent company bears the same name substantially as the plaintiff, and, confessedly, in its own trade territory it would have the right to use any of the words or names it is now using. The question is, therefore, can it use these names, letters and marks in plaintiff's trade territory."

The opinion held that the owner of a trade name "is not entitled to protection in advance of the extension of his trade" and that "he who first employed the mark in a particular market has the better right to that market."

"There was no right of good will established in this territory by the New Jersey company. There was no good will owned in common, but a separate good will appertaining to the separate business as carried on by the various companies in their allotted territory.

"Not only has the New Jersey company never had any actual business in these states, but that company has for many years acquiesced in the asserted claim of the various companies formerly in combination to the right of good will in their separate territories, and has itself claimed such rights in the territory occupied by it," the court said.

Esso, Inc., had advertised "not connected with Standard Oil Co. (Indiana)" and the circuit court held that Esso, Inc., manifestly "recognized that without this explanation, confusion and deception might result."

Entered St. Louis

The circuit court opinion on the claim that the injunction will obstruct operation of the 1911 dissolution decree held that:

"Plaintiff (Indiana Standard) is not asking that defendant be enjoined from entering its trade territory, but that it be enjoined from infringing plaintiff's trade marks, and from unfair competition.

"The dissolution decree established these companies as separate, individual, and independent corporations. It was not the purpose of the decree to prevent the application of the established principles and rules of unfair competition to them. No such question was there involved and these companies come into a court of equity on the questions here involved, unhampered by the decree of dissolution."

The Esso, Inc., case had its start in April, 1935, when the company entered the St. Louis market (N. P. N. April 24, 1935, p. 31).

Esso, Inc., leased three service stations, hung out the "Esso" signs, installed "Esso" globes and advertised to St. Louis motorists. One station had bulk storage facilities. Gasoline was received in tank cars and was distributed under a contract with a St. Louis trucking company.

Indiana Standard promptly started legal action with filing of a bill of complaint the next month in federal district court in St. Louis. Judge George H. Moore, in July, 1937, granted an injunction.

Indiana Standard claimed unfair competition and that the "Esso" trademark was a take-off of "SO" and confusing to the public, infringing on Indiana Standard's right to the "Standard Oil" trademark.

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Asphalt Committee Named

N. P. N. News Bureau

TULSA, July 25. — T. M. Martin, vice president of Lion Oil Refining Co., El Dorado, Ark., and L. H. Prichard, president of Anderson-Prichard Oil Corp., Oklahoma City, have been named chairman and vice chairman respectively of the domestic asphalt committee of the Independent Petroleum Assn. of America.

Other members of the committee are W. H. Morgan, R. R. Bush Oil Co., Long Beach, Calif.; J. B. Arthur, Union Oil Co. of California, Los Angeles; H. B. Pullar, Berry Asphalt Co., Chicago; R. W. Leslie, Skelly Oil Co., El Dorado, Kan.; F. W. McCurry, Derby Oil Corp., Wichita; Paul G. Blazer, Ashland Refining Co., Ashland, Ky.; J. L. Quinn, Standard Oil Co. of California, New York; L. P. Calkin, Phillips Petroleum Co., Bartlesville; W. D. Richardson, Cosden Oil Corp., Fort Worth, Tex.; and J. K. MacKinnon, Talco Asphalt & Refining Co., Mt. Pleasant, Tex.

Refining Technology

Small Polymerization Unit Reported Successful

By ARCH L. FOSTER, N. P. N. Technical Editor

● Present reports are that the small catalytic gas polymerization units which have been constructed and are now operating in two Michigan refineries, Leonard Refineries, Inc., at Alma, and McClanahan Refineries, Inc., at St. Louis, are proving decidedly successful, both from a technical and from an economic viewpoint. Operating on a quarter-million cubic feet or less of cracked gases from reforming and cracking Michigan crude, these units produce blending fluid of 82-85 octane number, with 100 "blending" octane number or higher.

Indications are that the total gasoline yield per barrel of crude at these plants is boosted three per cent or more by the conversion of the gases to motor fuel. Lead requirement is reduced by the higher blending value of the polymer, while the refiner may abate somewhat the severity of his cracking or reforming operations to further increase yields at the expense of somewhat lowered octane number of the cracked distillate, a reduction which is made up by the high blending value of the polymer fuel.

The operation of these plants is being watched closely by a large number of smaller refiners, we find, in the hope and belief that the successful adaptation of the polymerizing principle to the small plant might aid the small refiner very importantly in his struggle to keep pace with the larger operators. Heretofore polymerization has been considered practicable only for the larger operation, where the quantity of cracked gases runs into the millions of feet.

One of the first catalytic units built in the world was for the stupendous quantity of 27,000,000 cubic feet of gas per day, at Pan American's Texas City refinery. Since then capacity there has been or is to be increased. Probably the smallest catalytic unit to be built before installation of the Michigan units was the Shell unit at East Chicago, of something like three or four million cubic feet capacity.

With the increase in octane number of regular fuels imminent or actually in effect in some parts of the country, the small refiner has his work cut out for him to meet his competition. Lead must be used to meet the going rating of competitive fuels: even small increments of lead mount into large cost figures when spread over some thousands of barrels of gasoline per month. Nor does lead add appreciably to the total yield of gasoline per barrel of crude. Any economic means of aiding the small refiner to stay in the picture is welcomed.

* * *

Do Equipment Standards Lag Behind Industry's Needs

Someone said recently that the curve of progress in petroleum technology is rapidly approaching the vertical. Conservatively, progress in methods and processing developments has reached a dizzy speed, too fast for most of us to keep pace with it. Engineers are designing plant process pressures up to 4000-5000 pounds per square inch. Airplane motors are being built and used which generate 100 horsepower or more per cylinder, a power-ratio unheard of in the days of the old Jenny plane of wartime fame.

In the face of this, designers of equipment, metallurgists charged with the job of supplying the alloys and the equipment to withstand these terrific conditions—temperatures up to 1200° F. are in the offing, we hear—have no bed of roses. Standards of construction, specifications for equipment for these purposes have not yet been finally determined. Much experience has been obtained however, on what is required, and on the factors of safety, of proper length of service life required, and other points.

Whatever the standards may be when finally decided upon, they should take into consideration a safety factor which will be ample for all considerations. Temperatures and pressures are mounting at a startling rate, in the most modern refining practice. American operating technique is foremost in the world so far as we have any knowledge. Standards of design and construction *must* give adequate weight to safety and service hazard considerations, even at the expense of greater initial costs. The returns will be greater, in the long run.

●

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Heaters for Petroleum Refining, by L. A. Mekler **R-355**

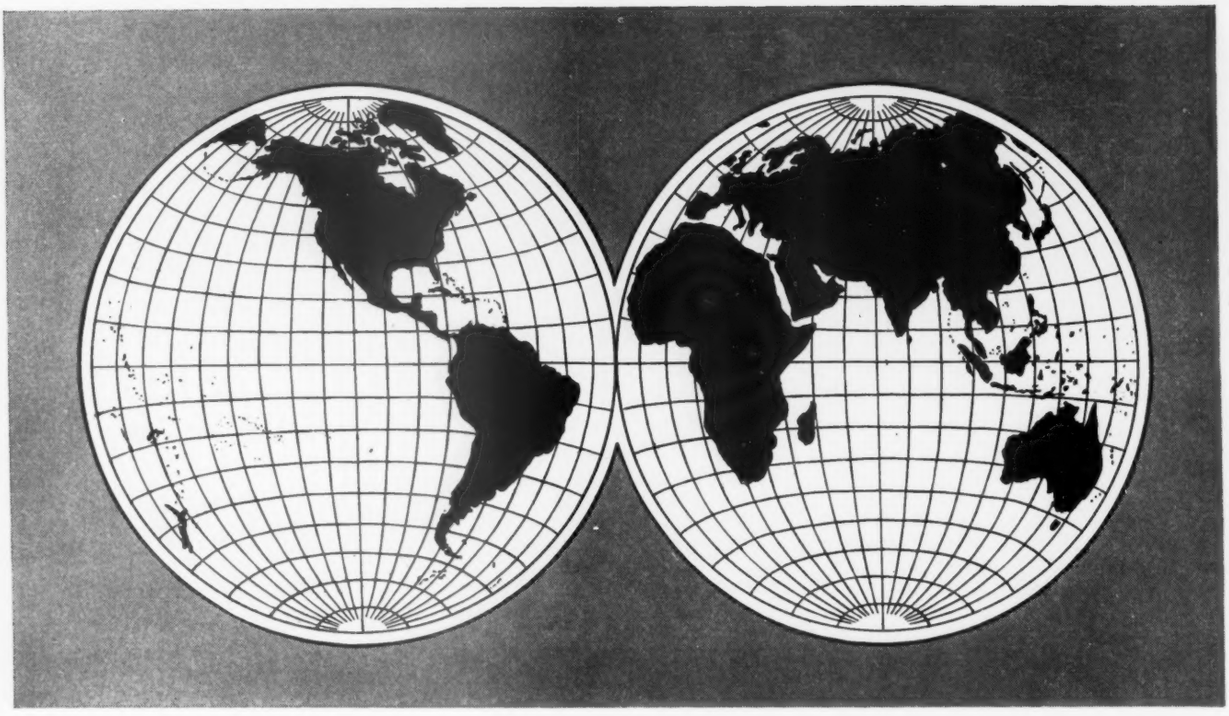
Development of tubular type heaters is discussed, in the light of various service requirements and designs of heaters are shown for specific time-temperature relationships. New type of Equiflux heater is described, in which the tubes are irradiated from both sides.

Large Tube Savings by Welding on 2-Ft. End Sections **R-347**

A plant-designed reconditioning system for still tubes by which they are inspected, worn ends cut off, and new sections welded on has increased tube life by 50% to 100% in Arkansas Fuel Oil Co.'s Bossier City, La. refinery.

"State of the Art" as seen in the world's current technical literature **R-350**

Advertisers' Index **R-367**



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PETROLEUM REFINING PLANTS

All tubes removed from the furnaces are given a reinspection to determine their fitness for further service. These tubes, just as they have been removed from the furnaces, have been inspected and marked as shown by the white lines about midway of each tube. They will be taken into the machine shop, shown at the rear left to be prepared for reconditioning. The screw-type press for straightening the reconditioned tubes is seen in the center of the pile of tubes

LARGE Tube Savings By Welding on 2-Ft. End Sections

By ALLEN S. JAMES
N. P. N. Staff Writer

A PIPE STILL TUBE reconditioning operation employing the use of electric welding is being used with unusual success at the Arkansas Fuel Oil Corp.'s Bossier City, La., refinery.

An increase of 50 per cent to 100 per cent in the service life of hundreds of still tubes has been obtained at a cost of $3 to $4 per tube since the now routine operation first was undertaken. There has not been a single tube failure traceable to the welding operation.

All of the reconditioned tubes have been the straight carbon steel type. Corrosion and temperatures and pressures in the cracking stills have not been problems of sufficient magnitude for the management to resort to the use of alloy tubes. Plant engineers are of the opinion, however, that the same operation could be used with success in reconditioning alloy tubes, provided the welding technique was properly adapted to that type of tube.

Most of the loss in wall thickness, the plant engineers have found, occurred at the ends of the tubes. When an inspection shows a number of tubes should be removed they are cut out and placed on the inspection rack. They are given another inspection which determines their future use. A tube which is unfit for further service in a furnace may have a section that can be used in the reconditioning of other tubes. A symbol denoting that fact is painted on the tube. Tubes found to be excessively scaly on the outside but which otherwise are serviceable are marked for future use in the topping furnace. Tubes which are in

The home made tester in operation, with the workman at the far end operating the hydraulic pump while the other workman watches the pressure gauge. Note the "U" shaped tools for handling the tube. A tube to be tested is lifted from the stack, placed on the long handles and rolled into place. After the test the handles are lifted, rolling the tube out of the tester and onto the heavy timbers forming the foundation for the stack of tested tubes

good condition except for the wear at each end are marked for use in the cracking furnace although they may also be used when necessary in the topping still.

A tube is prepared for reconditioning by being refinished at one end and then by having a 2-foot section cut from the other end. This leaves an 18-foot section of tube. A 2-foot section cut from a tube that has been selected for the purpose is then welded to the 18-foot section. The reconditioned tube then is back to its original length of 20 feet.

The ends of the tube and the section to be welded together are beveled to 45 degrees before being placed on the home made welding rack.

This rack was made by bolting together, side by side, two 20-foot tubes. Care was exercised to get the two tubes so fastened together that the "V" that holds the two sections to be welded will keep them in a straight line.

In placing the two sections on the welding rack, a slight space is left between the two beveled ends. As the welder works, helpers slowly rotate the two sections while one layer of welding material is built up on another. By doing the welding in layers, it was said, each succeeding layer stress relieves the one underneath.

After the welding has been completed the tube is taken to a large screw-type press for any straightening found necessary.

Then the tube is transferred to a homemade testing rack where it is subjected to an internal hydrostatic pressure of approximately 2000 pounds.

The tester has been constructed from two railroad rails, each slightly longer than the still tubes. The rails are placed just far enough apart to permit a tube to be placed between them. They are connected at each end by steel plates one inch thick and five inches wide. The plates have been welded to the rails.

A SMALL hole through one end plate permits passage of the pipe from the hydraulic pump to a cap which fits over the end of the tube. The other end plate has been drilled and tapped for a large screw. A cap has been fitted to the inner end of the screw, and attached to the cap is the pressure gage.

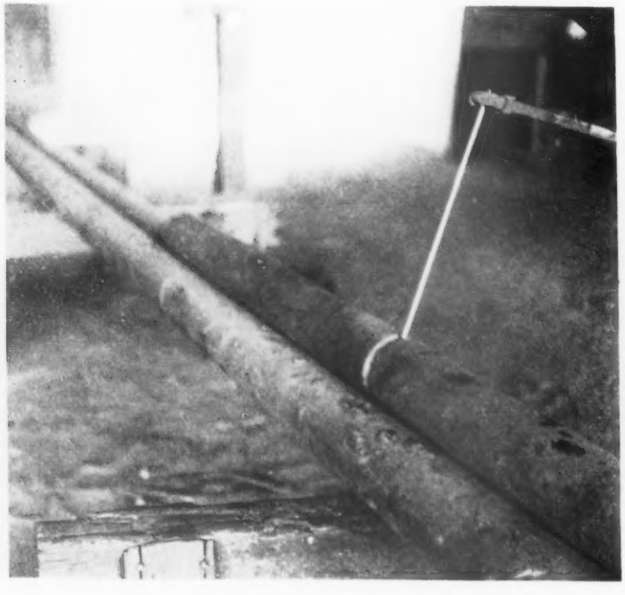
A tube is rolled into the tester, the caps fitted over the ends and the large screw tightened until the gaskets in the caps make pressure tight fits. Then the hydraulic pump is operated until the gage registers the desired pressure. If the tube passes this test it is rolled onto the stack of reconditioned tubes ready for replacement in the furnaces.

Plant engineers have adopted two rules in connection with the use of these reconditioned tubes.

The first rule is that no reconditioned tube is to be used more than once. After one stretch of service as a reconditioned tube it is inspected and if any part can be salvaged for the 2-foot length it may be used, but never is it completely reconditioned a second time and returned to the furnaces.

The second rule is that no reconditioned tube ever is to be placed in the two bottom rows or radiant section of either the topping or cracking furnaces.

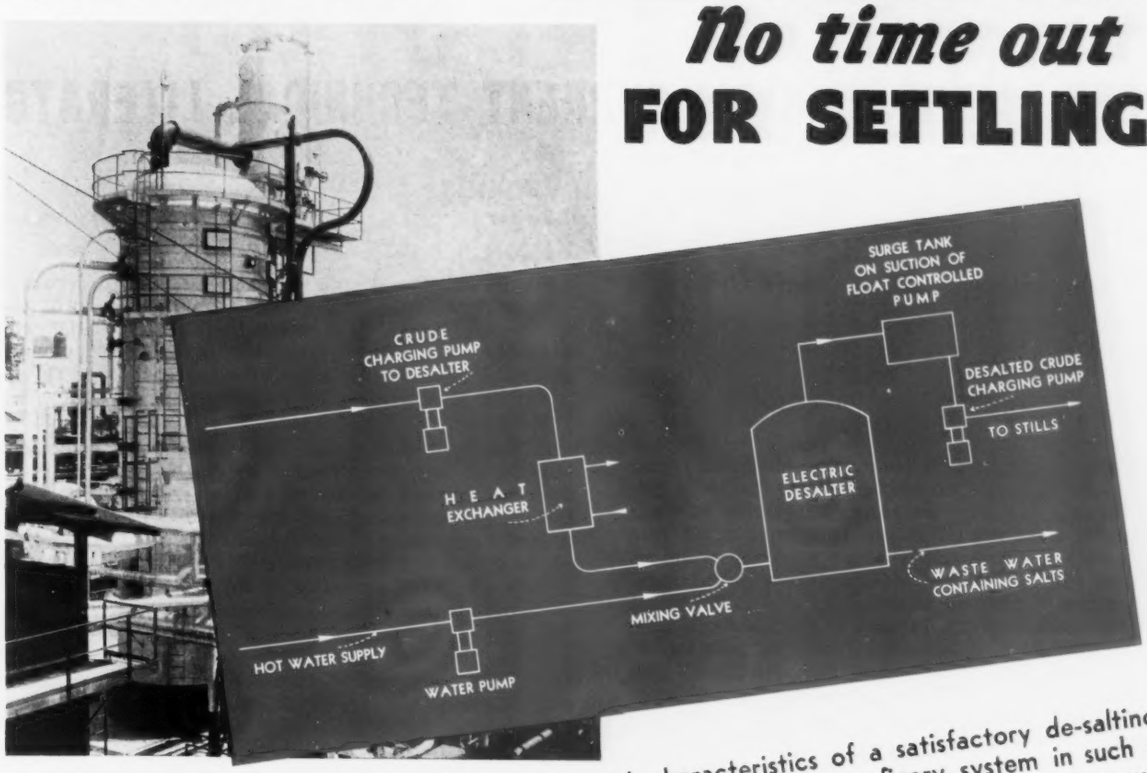
Closeup of the two sections of tube to be welded, showing the 45 degree bevel at the end of each



The welding rack is placed on two "horses," as shown in the above picture which also shows the two sections to be welded already in place and the welder ready to start work

How the finished weld looks is being pointed out by George Simpson of the engineering staff. One edge of the weld is just at the end of the pencil Mr. Simpson is using for a pointer

Continuous DE-SALTING
No time out FOR SETTLING



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AS SEEN IN THE WORLD'S CURRENT TECHNICAL LITERATURE

By M. G. VAN VOORHIS
N. P. N. Staff Writer

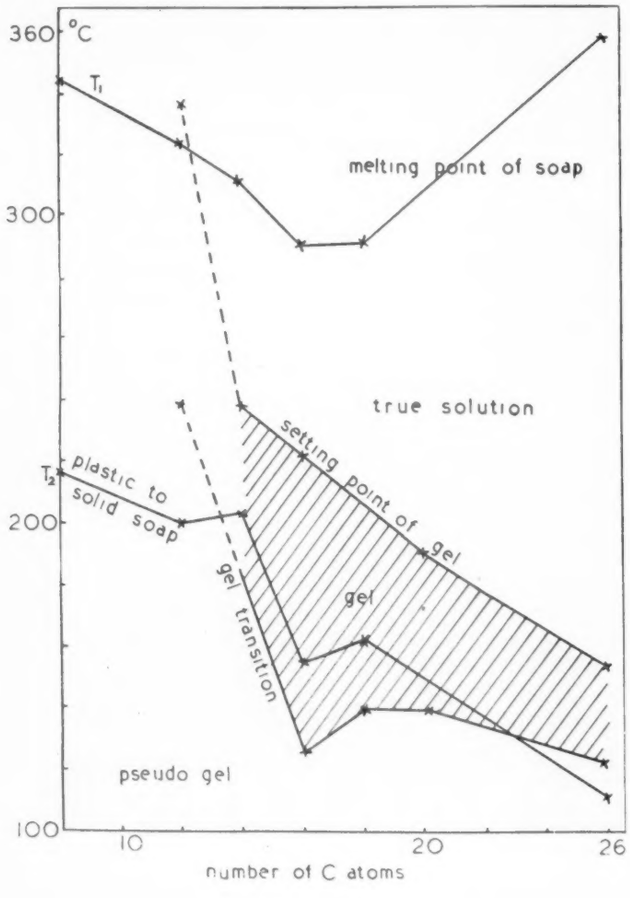
Lubricating Grease Structure

Systematic study of the physical properties of simple grease systems will solve problems of grease applications. A. S. C. Lawrence, J. Inst. Pet. Tech., April, 1938, p. 207.

The only hope of rationalizing the subject of greases lies in the systematic examination of the physical properties of simple systems and comparison with performance under various conditions, and then in finding the effects on these properties of added polar substances. The effects of impurities in the oils can then be deduced in terms of their polarity, even if their actual nature is unknown. If this preliminary work were carried out properly, the value of any sample of commercial grease could be assessed by a few simple chemical and physical tests.

One of the advantages of greases is the wide range of properties and behavior which are available, and which should make it possible to compound the best grease for any given job. No published knowledge of the value of greases for the particular purposes to which they are applied has been available, nor of their limitations, nor of their optimum composition for such uses.

Soap-oil systems exist in three forms: true solution, true, gel and pseudo-gel, which is a paste of micro-crystals. Commercial lubricating greases may be either of the latter two forms between which there is a well-defined temperature of transition dependent upon the soap used and upon the presence of polar substances such as fatty acid, water or glycerin, which lower this temperature. These greases are not emulsions comparable to butter and tallow.



Dispersion of the soap in the oil can be brought about by stirring at any temperature above that of transition and does not require raising to that of true solution. Formation of gel and pseudo-gel are crystallizations and the mechanical properties of the systems are due to the properties of the separating soap particles. The properties are greatly modified by small amounts of fatty acids.

Systematic tests were conducted to determine the gelation and transition temperatures of 19 sodium soaps in nujol solution and the melting points and transition points (plastic to solid soap) of the soaps alone. Similar data was compiled for 14 metal stearates. In these tests it was noticed that the strength of gel was parallel to the hardness of the soap. Only those soaps which, on heating, pass through an intermediate plastic form, which at a higher temperature, melts sharply to isotropic liquid, gelate in oil solution. Further, the range of stability of gel is parallel to the temperature range over which the solid soap is plastic.

The accompanying figure shows the results for the sodium soaps of the saturated fatty acid series. The explanation of what happens is that on heating the soap with nujol, the oil can penetrate only in between the hydrocarbon chains of the soap crystal lattice. Solution occurs when the temperature is high enough for thermal disruption of the polar —CO_2Na groups. This occurs somewhat below the actual melting point of the solid soap because oscillations of the hydrocarbon chains of the soap molecules help to disrupt the polar groups.

Gelation is a crystallization. There are two reasons why the stable gel is formed only by those soaps which pass through the plastic stage. First, those soaps which do not pass through the plastic stage all have low melting points which increase with increase of chain, thus showing that the adhesion of the hydrocarbon chains is greater than that of the polar heads. Second, the plastic state of the soap is, in the gel structure, swollen with oil and unable to undergo particle growth according to the thermodynamical considerations which make suspension of small crystals unstable.

Soap-oil systems can, therefore, exist in the following three forms: True solution with a viscosity but slightly greater than that of the oil alone, true gel, and pseudo-gel or paste of fully crystalline soap suspended in oil. The crystallites are very tiny, but grow larger on standing. With sufficient concentration of soap the system is a plastic paste, i.e. it has a yield point due to its rigidity. At small concentrations the soap segregates. The system is not homogeneous, distortion of the paste produces "artefracts" which do not "heal." Contraction of the soap in the mixture, either by thermal contraction or by particle growth, causes extrusion of oil and "bleeding."

While the question of which physical state is required remains unanswered, the choice of a soap as thickener involves two factors, the temperature range of rigidity de-

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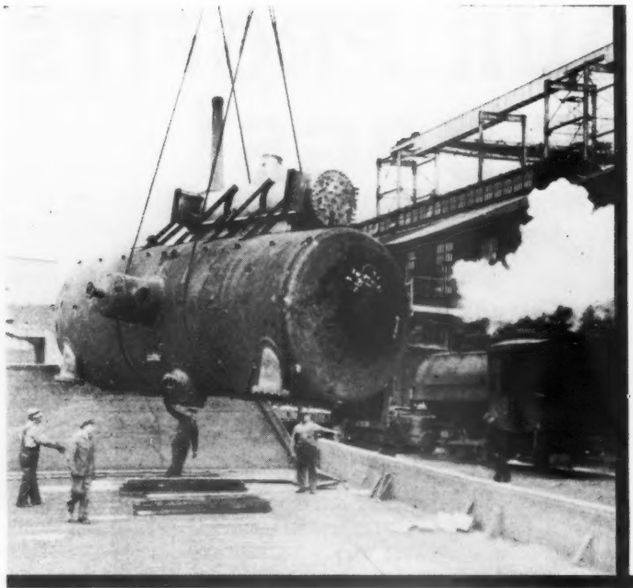
GASOLINE ANTIOXIDANTS



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sired and another unknown point of most suitable physical state. The optimum temperature for preparation is not definitely set but should be as low as possible, to prevent syneresis.

Recognition of the need for the presence of small amounts of water, glycerine and fatty acid has given rise to the myth that greases are emulsions of water in oil stabilized by the soap. It is only necessary to point out that greases have none of the characteristics of emulsions and that there is a simple mechanism which accounts for all of the observed facts. Polar substances in small quantity aid dispersion and alter the nature of the grease.

It has been shown earlier that aqueous soap solutions are peptized very efficiently by small amounts of alcohols, phenols and amines. Sugars, including glycerine, peptize, but much larger amounts are required, since there is a distribution of the added substance between solvent and soap. It is suggested that the mechanism of the attachment of the added polar substance is dipole adhesion to the polar groups of the soap, thereby reducing their mutual cohesion.

In correlating some of the physical characteristics of greases with their composition and value of lubricants it is necessary to specify first the duty for which they are required. A serious difficulty is the decision whether the preference for grease over oils is because of its advantage in application or because greases are superior lubricants to the oils. The problem involves flows and a fundamental objection to all flow experiments is that they involve a parabolic velocity distribution across the tube if flow is Newtonian. In any case, it is obvious that the temperature changes of constitution and properties are even more important than the value determined at any particular temperature.

* * *

Packed Column Design

Gas density and liquid viscosity correlation with flooding velocity proves useful in packed column design. T. K. Sherwood, G. H. Shipley, and F. A. L. Holloway, Ind. Eng. Chem., Ind. Ed., July, 1938, *p.* 765.

The effects of gas density and liquid viscosity on the flooding velocity, as determined in an experimental packed column have been applied to the development of a new method of correlating flooding velocity measurements in large columns containing Raschig rings varying in size from 12.7 to 35 mm. Surface tension of the liquid was found to have no appreciable effect. Flooding velocities on stacked rings were much higher than for dumped rings.

The utility of general flooding velocity data lies first in determining the limiting gas and liquid rates above which operation is not possible, and in estimating the optimum liquid and gas rates where there are not sufficient data to make an exact economic balance of the costs involved.

Flooding velocities are a function of the liquid and gas rates, the physical properties of the two fluids, and the characteristics of the packing material.

The suggested method of correlating the data is to plot as abscissa the volumetric ratio of liquid to gas rates (Q/u_o) and as ordinate the square of the gas velocity based on free area of the packing, divided by the mean hydraulic radius of the packed section. The ordinate is written as u_o^2S/gF^3, in which u_o is the superficial gas velocity (based on empty tower) in feet per second, S is the surface area of the packing in square feet divided by tower volume in cubic feet, g is the acceleration of gravity, and F is the fraction of free volume in packing in cubic feet divided by the tower volume in cubic feet.

Flooding velocities are calculated from a plot of $(u_o^2S/gF^3)\ (p_G/p_L)v^{0.2}$ vs. $(L/G)\ (p_G/p_L)^{0.5}$.

p_G = gas density (lb./cu. ft.)

p_L = liquid density (lb./ cu. ft.)

v = viscosity of liquid, centipoises

L = superficial mass velocity of liquid = Q_{p_L}, lb./(sec.) (sq. ft.)

G = superficial mass velocity of gas = $u_o p_G$, lb./(sec.) (sq. ft.)

The use of this plot is straightforward if the ratio L/G is known but is by trial and error if only L is known.

The available flooding velocity data for Raschig rings in towers sufficiently large to eliminate the wall effect correlate well by this graphical method. Flooding velocity data for miscellaneous packing materials fit the general correlation for dumped rings well also, indicating that the dumped ring correlation may be used to estimate flooding velocities for any dumped packing material for which there are no data.

* * *

Saturated High Octane Fuels

Saturated high octane fuels have been produced without hydrogenation by alkylation of olefins and their polymerized derivatives with paraffinic hydrocarbons. S. F. Birch, A. E. Dunstan, F. A. Fidler, F. M. Pim and T. Tait, J. Inst. Pet. Tech., June, 1938, *p.* 303.

Alkylation of olefins and their polymerized derivatives with paraffinic hydrocarbons at low temperatures without the expensive hydrogenation processes, to produce saturated iso-hydrocarbons of high octane ratings has been accomplished. Sulfuric acid of 97% concentration is the agent used to affect the combination of the olefins and paraffins in a solution of a problem which has occupied the minds of fuel chemists for a number of years.

The condensed or alkylated fraction from this reaction, boiling up to 365° F. is saturated, has an octane number of 90 (Motor Method) and is raised to 100 octane number by the addition of only 1.5 cc. of tetraethyl lead. The yield is about 70% of the total charge, or 140% of the olefin charged. Only a simple soda wash was necessary to refine the product, which is extremely low in sulfur.

This process for production of high octane number "synthetic" fuels brings up the total number of synthetic methods to five, which include:

1. Acid polymerization followed by hydrogenation.
2. Selective polymerization and hydrogenation.
3. Cold acid polymerization, followed by reaction with iso-butane.
4. Selective polymerization and reaction with iso-butane.

A steel bubble tower, 92 feet long by 13 feet two inches diameter was shipped recently from the Heine Boiler Division of Combustion Engineering Co., Inc., at St. Louis, to Smith's Bluff, Texas, for installation in the Pure Oil Co. refinery there. It weighs 245 tons, and was shipped on two 16-wheel, 400,000-lb. capacity freight cars; only four such cars are in use in the U. S. The tower, after its seams were fusion-welded, was annealed at 1150° F. for four hours, to eliminate stresses. Several other huge vessels have been built in this plant recently

5. Direct addition of iso-butene to iso-butane.

From all these processes the products are iso-paraffins, with considerable differences in yields and in octane ratings. This latest development makes the potential supply of 100 O.N. fuels dependent, not on iso-butene but on the supply of iso-butane.

The process is, briefly; 97% sulfuric acid and iso-butane are placed in a low-pressure jacketed vessel, and the olefin added during a 90-minute period, with vigorous agitation of the reacting materials. A temperature of 20° C. (68° F.) is maintained in the vessel by circulating a coolant liquid through its outer jacket. The pressure inside falls from 45-50 lbs. to atmospheric, the stirring is continued for 30 minutes after the last olefin is added, the acid is separated, and the hydrocarbon layer is neutralized with a caustic soda wash. Unchanged iso-butane is removed by distillation, and the finished product has a specific gravity of 0.700 to 0.715 (70.0 to 65.8 A.P.I.), and a bromine number of 2-5. The product is redistilled taking overhead about 85% of the product, or up to 365° F., leaving the remaining 15% a pale to brown color of about 0.783 specific gravity.

The best results are obtained from the reaction of iso-butane with the polyiso-butene product from the reaction of the butenes and butene-iso-butene addition products. Yields from this reaction are shown to be 73-82% of the reacting charge, and the optimum reacting temperature with 97% sulfuric is 68° F. At higher temperature a considerable amount of oxidation and the formation of SO_2 fouls the acid, and a lower octane number results.

The reactants were employed in the ratio of 4 mols of iso-butane to one of iso-butene, an excess of the paraffin giving a better yield and slightly improved octane number. The acid concentration is a highly important factor, and 97% commercial acid was found satisfactory except when reacting a more difficultly polymerizable olefin such as propylene, when slightly higher concentrations are used. Too high acid concentration leads to considerable oxidation with lower yields and lowered octane ratings. Lower concentration of acid lowers its effectiveness rapidly, a 60% yield of 87 octane number material being produced by 90% acid at 50° C. (122° F.). The time of addition of the olefin is of small importance, while the more vigorous the agitation the better the yield and the higher the octane number.

TABLE 1

Yields of High Octane isoParaffins available from C_4-Olefines and their Polymers or Co-Polymers

	(a) From Diiso-butene by Hydro-genation	(b) From Polyiso-butenes and iso-Butane	(c)* From B.I.B. by Hydro-genation	(d) From B.I.B. and iso-Butene	(e) From C_4-cut and iso-Butane
Yields per unit of iso-butene	0·7	1·5†	1·5	2·3†	4·2†
Octane number, C.F.R. motor method	98-100	92	95	91	91

*B.I.B. = Butene-isobutene.

(a) Based upon 70 per cent conversion of isobutene to diisobutene.

(b) The crude acid polymerization product may be used

(c) Based upon a conservative conversion figure of 1·8. An 85 per cent fraction (b. pt. 95-120° C.) thus gives 1·5 for the useful product.

(d) Based on an 85 per cent fraction. A correspondingly higher yield is possibly by taking a wider fraction (b. pt. 95-180° C.)

(e) C_4-cut ex H.P. cracking units. Total unsats. 56 per cent, isobutene 20 per cent.

† The figures in the second, fourth and fifth columns are based on an economical acid consumption.

TABLE 2

Yield of 100-Octane Gasoline based on Unit Quantity of isoButene

	From** D.I.B. by Hydro-genation	From Polyiso-Butenes and iso-Butane	From B.I.B. by Hydro-genation	From B.I.B. and iso-Butane	From C_4-cut and iso-Butane
Yield of 100-octane gasoline per unit of iso-butene	1·27	2·0	2·5	3·1	5·6
Composition:					
isoParaffin base	55	75	60	75	75
Gasoline cut*	45	25	40	25	25
T.E.L./gal.(Imp.)	3·5	2·6	2·9	2·6	2·6

*Octane number 70 (C.F.R. motor method).

**D.I.B. = Diisobutene.

Operating on refinery cracking still gases, a cut containing about 50% olefins was taken from the plant stabilizer and satisfactory results were obtained, the 3.6% of butadiene causing no trouble or ill effects. In place of pure iso-butane a cut containing 70% of iso-butane was used in this reaction for the paraffin constituent and gave a suitable product. As a result of this work it was determined that a good yield of 90 octane number product can be made from refinery gas concentrate, the so-called C_4 fraction, along with an iso-butane concentrate.

Typical results of producing these fuels by different processes are shown in Table 1, included herewith. Table 2 shows details of blending 100 octane number fuels from the alkylated product and a 70 ASTM octane number gasoline. While the octane number of the iso-butene-iso-butane reaction product is appreciably lower, the yields are very much higher, economically a decided advantage for the latter.

Humphries Granted Priority In Howard Interference

WASHINGTON, July 23.—That successful laboratory operation of an invention may constitute "reduction to practice," in the meaning of the patent law, is the principle on which the U. S. Court of Customs and Patent Appeals affirmed the decision of the Patent Office Board of Appeals, which awarded priority in a cracking patent reissue interference to Robert W. Humphries, Standard Oil Co. (Indiana), over William R. Howard, Universal Oil Products Co.

The interference was between the application for reissue of patent No. 1,647,629, Nov. 1, 1927, application for reissue filed Jan. 26, 1929, by Humphries, and reissue patent No. 18,357, Feb. 23, 1932, to Howard. Each applies to the cracking of pressure still bottoms, or "naphtha bottoms"—the expression used in the opinion—at pressures above those used in cracking the virgin stock in another type of apparatus.

Humphries claimed that he reduced his invention to practice about Sept. 12, 1917, having conceived the idea in the summer of 1917. This reduction to practice consisted in building and operating a five-gallon capacity still in which pressures up to 200 pounds were used. Later a 20-gallon still at pressures up to 350 pounds was operated for the same purposes.

Howard's original application was filed Sept. 8, 1919, and his patent was granted. Application for reissue was filed in March, 1927, and the patent reissued in 1932 as stated above. Howard claimed that the laboratory work of Humphries did not constitute reduction to practice and the Examiner of Interference held in his favor. The Board of Appeals reversed this decision.

Humphries claimed that, when orders were given in 1917 for larger stills to carry out this invention, stills suitable for the pressures used were not known by manufacturers, so that designs had to be developed carefully over a period of considerable time. Also, this country was at war, and all available fabricating facilities were overloaded with war construction, and that a long time elapsed before a suitable commercial-sized still could be obtained.

The large still was installed in 1920, a later date than that of Howard's date of conception of the principle he employed for the same purpose. The Board of Appeals, and now the Court of Customs and Patent Appeals held that, under the conditions, the invention had been reduced to practice as early as Sept. 12, 1917. "Authorities seem to be well settled that commercial production is not necessary to constitute reduction to practice," was the statement made by the same court in an earlier case (Weitzel v. Lacy, 17, C.O.P.A., (Patents), 943, 39 F-2nd, 672).

Howard argued that the smaller scale stills did not constitute reduction to practice because of the coke deposition in the apparatus. Recognizing the effect of coke, the court decided that the original run records make no mention of coke forming and considered that this indicates that the amount of coke was negligible.

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Heaters For Petroleum Refining

By L. A. MEKLER*

PART 1

ABSTRACT

The accompanying article is a thorough discussion of the development of heaters as used in oil refining, through the early stages of their development, to designs suitable to meet the complex operating conditions in refineries today. The three principal groups of service requirements for heaters are discussed and a number of heating curves are shown with different relationships of heat requirements and rates of heat input in the coil.

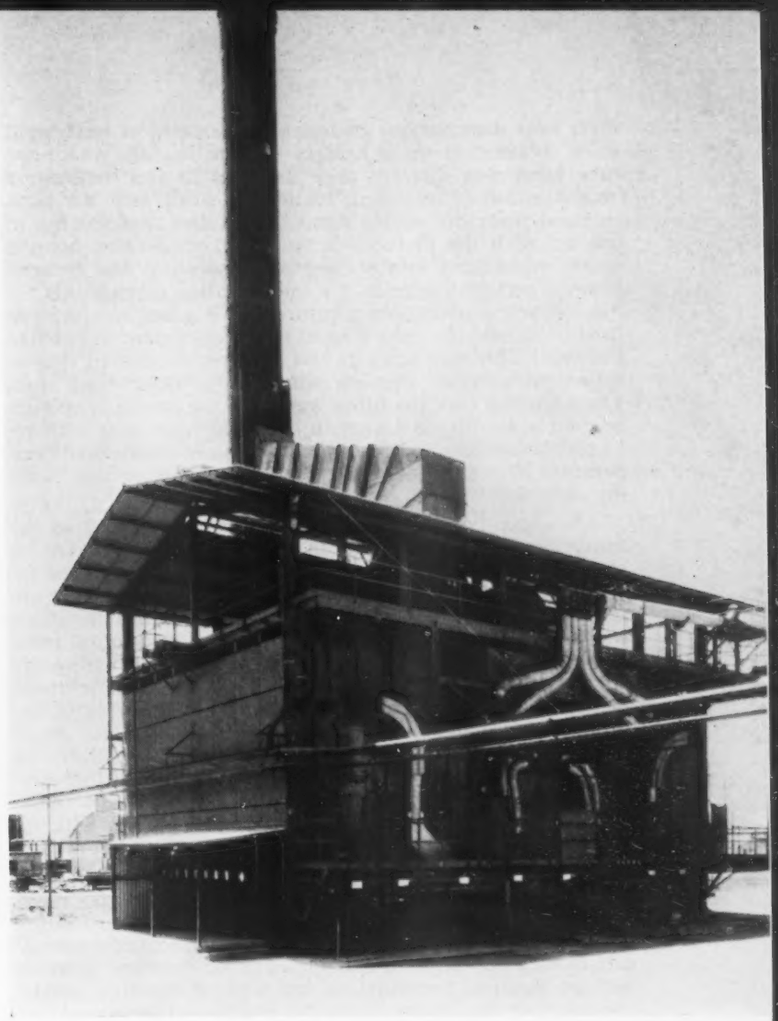
Many designs are illustrated for heaters to meet specific time-temperature relationships, particularly heaters for multi-coil cracking operations. The new type of Equiflux heater, in which the tubes are irradiated from both sides, is described as applicable to widely varying operating requirements of capacity, type of feed and time-temperature relationships.

THE earliest heaters for petroleum refining consisted of cylindrical shells set over a firebox, with the lower portion of the cylinder absorbing heat from the flame, the refractories and the products of combustion that swept the lower rear portion of the shell on their way to the stack.

Because of a large volume of oil per unit of heat-absorbing surface and low velocities with which the surface was washed by the oil being heated, shell heaters were limited to low rates of heat input. The permissible maximum was determined by the rate of free convection or convection induced by steam jets within the body of the oil, which even with boiling fluids was too low to permit rates much in excess of 3,000 B.t.u. per square foot per hour without overheating the oil in contact with the heated portion of the shell.

Coke deposition and burning out of still bottoms almost invariably followed attempts to force shell heaters much above these rates. The addition of internal flues to shell heaters to simulate a fire tube boiler materially improved their operation and increased their capacity. However, shell heaters were primarily batch heaters, and continuous operation, which gradually displaced batch operation in the larger refineries, could be accomplished with them only by operating a battery of shell heaters in series, each shell operating at a slightly higher temperature than its predecessor in the series. With large scale operation in some fields, such as California, batteries of shell heaters became too cumbersome.

*Combustion engineer, Universal Oil Products Co.



Type "A" 4-cell Equiflux heater for processing 29,000 bbls. of heavy combined feed per stream day

Comparatively successful application of tubular heaters on a small scale for dehydration and refining of emulsified oils led to the gradual adoption of tubular heaters for general refining purposes and eventual substitution of shell heaters by tubular heaters for large-scale refining operations.

The introduction of cracking, which called for heaters that could withstand higher pressures and higher metal temperatures than could be withstood by an externally heated shell, contributed greatly to the development of tubular heaters and definitely demonstrated their superiority over the shell type.

The earlier tubular heaters varied little in their setting from shell heaters, the main difference being that the shell was displaced by a bank of tubes placed over the firebox. However, since a definite velocity was imparted to the oil by pumping it continuously through the tube bank and the ratio of heating surface to volume was greatly increased, average rates of 5,000-6,000 B.t.u. per square foot were obtained without particular difficulties in the early tubular heaters in spite of the normally present zones of local overheating, or "hot spots" in some sections of the tubes directly over the fires with actual rates of 15,000-20,000 B.t.u. per square foot.

As the average rates of heat input and the oil temperatures were increased, the hot spots became more pronounced and troubles were encountered with failure of tubes in these hot spots, particularly in heaters, where counter-current flow of oil and gases was intended. The troubles were first attributed to radiation from the flames in the firebox, and a number of tubular heaters were built with the tube bank separated from the firebox by solid or perforated walls to protect the tubes from this radiation. Because of more uni-

form heat distribution, greater average rates of heat input were obtained in these heaters than in heaters where the tube bank was directly over the fires in the combustion chamber, but it was soon found that even with the bank shielded from the visible flames, the tubes first coming in contact with the invisible products of combustion became easily over-heated unless the gas temperature was reduced below a certain minimum for the operation carried out.

Reduction of the temperature of the gases entering the tube bank was the next step in the development of tubular heaters. This was done in two different ways. In the so-called "convection" heaters, where only "fluid" heat from gases flowing over the tubes was used, the products of combustion were diluted first with excess air and later with returned or recirculated flue gases, to obtain the desired temperature of the gases entering the tube bank or the "heating chamber".

In other heaters, "radiant" tubes were installed in the combustion chamber to cool the products of combustion by absorbing radiant heat from the flame, the gases and the refractories of the combustion chamber before the gases entered the "main" or "convection" bank of the heater, which was intended to supply the major portion of the total heat, and which was usually separated by a bridge wall from the combustion chamber. Particular care was taken in these heaters to place the "radiant" tubes out of the path of the products of combustion. To reduce the rates of heat input which would be absorbed by the relatively small number of tubes that were subjected to the full radiation in the combustion chamber, the tubes were shielded from this radiation by surrounding either the tubes or the flames with refractory enclosures, which cut these rates approximately in two.

High maintenance and operating costs of flue gas recirculating equipment and frequent failures of the enclosures around the tubes or the flame, together with comparatively satisfactory operation of some open-flame "radiant" heaters without flue gas recirculation and without shielding either the tubes or the flame, led to the gradual abandonment of the flue gas recirculating and the shielded "radiant tube" heaters and their substitution with the open-flame type.

Improvement in heat generation and distribution and better understanding of the laws of radiant and convection

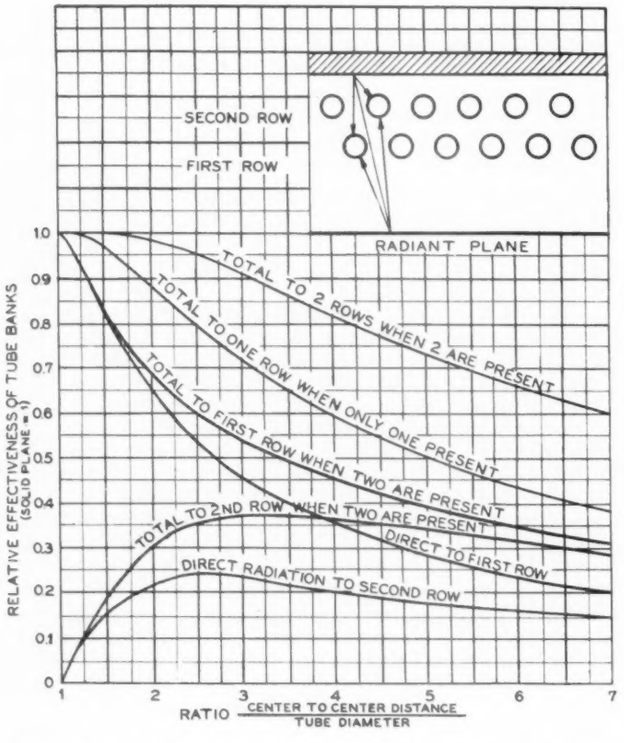


Fig. 1. Relative effectiveness of tube banks compared to plane surface. (Hottel)

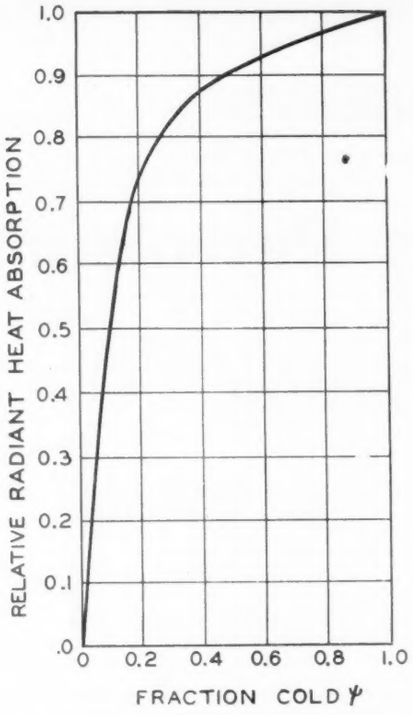


Fig. 2. Relative effectiveness of heat-absorbing surface as function of "fraction cold". (Wohlenberg)

heat transfer, greatly contributed to the development of open-flame heaters and their almost universal adoption for oil refining. The proportion of radiant heat input has been gradually increased from 25 per cent of the total in the early heaters to as high as 80 per cent of the total in the latest designs. Consistently long runs with heat transfer rates of 20,000 B.t.u. per hour per square foot of internal tube surface for the radiant heat absorbing banks are not uncommon, even when processing residual oils at temperatures over 950° F.

Since modern heaters supply from 60 to 80 per cent of the total absorbed heat by radiation, their operation is determined primarily by the rates of radiant heat transfer that can be obtained and safely applied to the oil.

Rates of radiant heat transfer follow the Steffan-Boltzman law and can be expressed by the equation—

$$Q_R = .174CS_E[(T_F/100)^4 - (T_S/100)^4]$$

where—

Q_R is the heat absorbed by radiation, B.t.u./hr.

C coefficient, depending on the relative emissivity of the radiating and heat absoring surfaces (C = 1 for black body condition)

S_E equivalent "effective" heating surface, sq. ft.

T_F "effective" furnace temperature, °Rankin.

T_S temperature of the heat-absorbing surface, °Rankin.

"Effective" radiant heat-absorbing surface is a theoretical plane surface having an emissivity of unity and receiving heat from a radiating plane parallel to and equal in area to the heat-absorbing plane. In practice, radiant heat-absorbing surface is ordinarily formed of banks of metal tubes spaced at intervals, the banks containing as many as four rows of tubes, with the banks often located at various angles to the radiating plane. Such heat-absorbing surface S_A can be expressed in terms of equivalent "effective" heat-absorbing surface S_E by the use of coefficients which express the service conditions of the actual surface in terms of the theoretical.

Fig. 1 shows the Hottel curves of relative effectiveness of tube banks with single and double rows of tubes placed on different center-to-center distances along a re-radiating non-conductive wall and irradiated on one side from a plane parallel with the wall. From this figure the effectiveness of a bank with a single row of tubes placed on a center-to-cen-

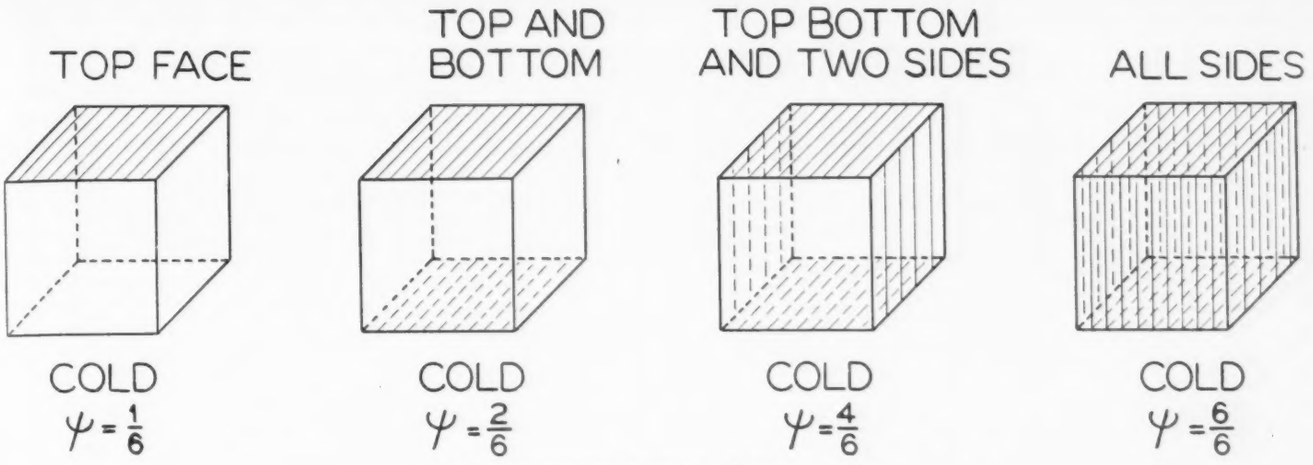


Fig. 3. Diagrammatic illustration of "fraction cold"

ter distance of two diameters (the most common spacing) is 0.87 of a plane surface. Each square foot of the circumferential area of this tube bank has an average effectiveness of $\frac{0.87 \times 2}{\pi}$, or approximately 0.55. A bank with two parallel rows of tubes spaced on the same centers, and arranged as shown in the diagram, has an effectiveness of the bank of 0.98, for both rows. Since the amount of circumferential area in the double row is double that of a single row, the average effectiveness of each square foot of circumferential area of the double row bank is only $0.98 \div \pi$ or 0.31.

Fig. 2 shows the Wohlenberg curve of relative radiant heat-absorbing capacity of plane surfaces as affected by the ratio of the heat-absorbing plane ("cold" surface) to the projected area of the furnace envelope ("cold" surface plus refractory walls), or "fraction cold" of the furnace envelope as illustrated for a cube on Fig. 3.

With a given total liberation, a heater with the furnace envelope completely covered with cold surface (fraction cold 1.0) will absorb by radiation a maximum of the available radiant heat energy which is unity on the curve. Experimental results, substantiated by mathematical analysis, indicate that in the same heater with the same liberation the heat absorption will be approximately 67 per cent of the maximum when only one face of the cube is covered with cold surface (cold fraction 0.166), approximately 80 per cent of the maximum (cold fraction 0.332) when two faces of the cube are cold, and approximately 90 per cent of the maximum when three faces of the cube are cold (cold fraction 0.5). The relative radiant heat-absorbing effectiveness per cold face of a cubical chamber of a heater is therefore $1.0 \div 6 = 0.166$ when all faces are cold; $0.9 \div 3 = 0.3$ when three of the faces are cold, and 0.67 when only one of the faces of the cube is covered with cold surface.

Fig. 4 shows the relative effectiveness of the circumferential surface of tube banks with single and double rows of tubes spaced on two diameters and placed in a cubical combustion chamber when the fraction cold is varied from 0.166 to 1.0. The curves on this figure are derived from Figs. 1 and 2 according to equation—

$$E_{RS} = \frac{f_1 \times f_2}{n}$$

where—

E_{RS} = the relative effectiveness of circumferential surface,

f_1 = the relative effectiveness factor of circumferential area of tube banks, as derived from Fig. 1 (0.55 for a single row tube bank and 0.31 for double row tube banks),

f_2 = the relative effectiveness factor of the cold fraction involved as shown on Fig. 2 (0.67 for 1 cold face; 0.90 for 3 cold faces, 1.0 for 6 cold faces) and

n = number of cold faces making up the cold fraction.

The values of relative effectiveness of tube banks and their circumferential surface shown on Figs. 1, 2 and 4 apply to banks irradiated from one side only and placed against a non-conductive wall which reradiates to the bank all of the heat that passes to this wall between the tubes. Under these conditions, the effectiveness of the half of the circumferential surface of the tubes facing the radiating plane (the exposed face) is many times that of the half receiving heat by reradiation from the wall (the shielded face). For example, with a single row of tubes placed on a center-to-center distance of two diameters, the exposed face of the tubes has a relative effectiveness of 0.66, which is over 75 per cent of the effectiveness of the total tube surface and

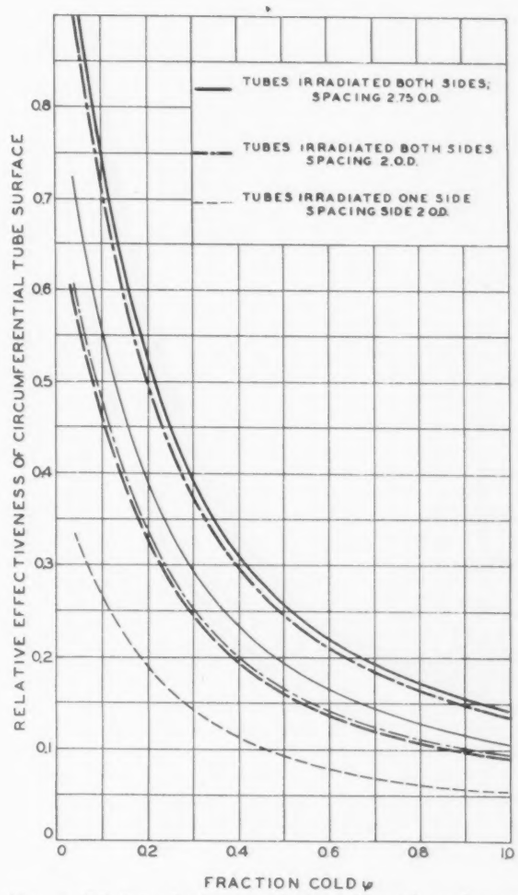


Fig. 4. Relative effectiveness of circumferential surface as derived from Figs. 1 and 2 for irradiation from one side and both sides. Thin lines — double rows of tubes. Thick lines — single rows of tubes

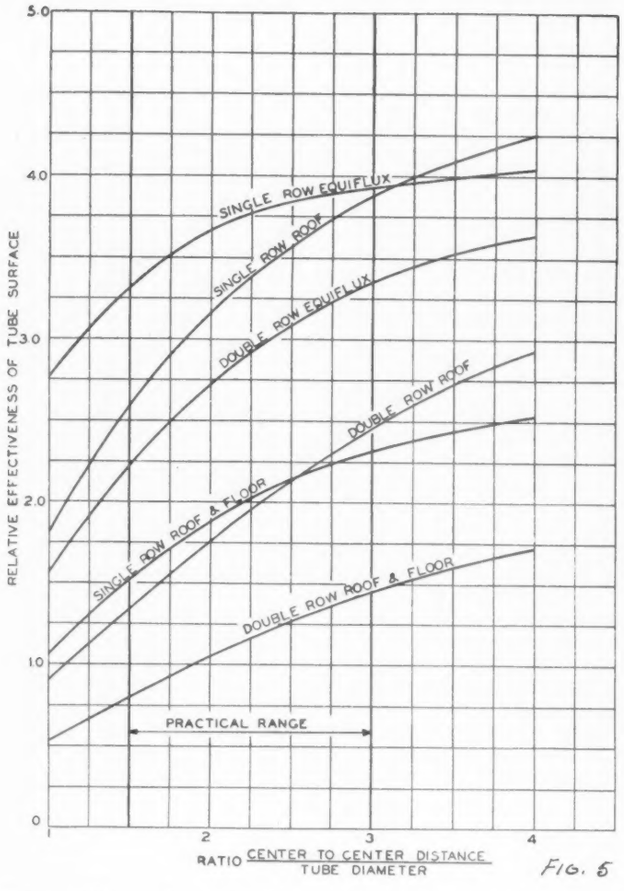


Fig. 5. Relative effectiveness of circumferential surface with irradiation from one side and Equiflux (two sides)

three times the effectiveness of the shielded face of the tube. With a bank having two rows of tubes on the same spacing, the exposed face of the first row has three times the effectiveness of the exposed face of the second row and 16 times the effectiveness of the shielded face of the first row. The average effectiveness of the total circumferential surface of the first row is almost twice the average effectiveness of that of the second row.

With tubes irradiated from both sides, that is with the bank placed between two radiating planes, both halves of the circumferential area of the tubes become "exposed" faces. With a single row bank of tubes irradiated on both sides and spaced on two diameters, the effectiveness of the bank is therefore twice that of the exposed face of a bank irradiated on one side, or 1.32 of the equivalent plane surface. This is approximately 52% greater than the total effectiveness of a similar bank irradiated from one side only. With two row banks irradiated from both sides, each row has the same average effectiveness and the two rows have an effectiveness approximately 40% greater than similar two rows irradiated from one side only.

In actual furnaces, banks irradiated from both sides, form, as a general rule, a smaller cold fraction of the total furnace envelope. Therefore, the relative effectiveness of a bank irradiatd from both sides, as obtained from Fig. 1, is further increased because of the greater effectiveness of a bank with a lower cold fraction. Fig. 5 shows the relative effectiveness of circumferential tube surface of single and double row tube banks as normally placed in heaters using irradiation from one and two sides. The effectiveness of the circumferential area of tubes spaced on two diameters and placed in single rows along all six sides of a cube (0.052 of the plane on Fig. 1.) is taken as unity in this comparison. The effectiveness of banks irradiated from one side is derived on the basis of banks placed in a combustion chamber 18 ft. wide, 16 ft. high and 40 ft. long (fraction cold approximately 0.5), while the effectiveness of tubes irradiated from both sides is derived on a basis of the banks placed in the middle of a combustion chamber 8 ft. wide, 12 ft. high and 40 ft. long (fraction cold approximately 0.35).

Irradiation from both sides not only increases the effectiveness of single and double row banks, or makes both rows of a double row bank of equal effectiveness, but tends to distribute the heat intensity around the circumference of the tube more uniformly, so that for a given maximum rate of heat transfer to any portion of the circumference, higher average rates can be used, or with the same average rates, the maximum rate will be considerably lower as shown qualitatively on Fig. 6.

THE effective furnace temperature T_F is theoretically the logarithmic mean temperature of the furnace as it changes from the flame-burst temperature to the temperature of exit gases from the radiant heat-absorbing chamber. It is often referred to as the equilibrium temperature of the furnace, since it is that temperature at which an equilibrium condition is obtained between the flame-burst temperature, the liberated heat, the radiant heat absorbed by the heat-absorbing surface present and the exit gas temperature. Since the mean temperature is difficult to determine experimentally and rather cumbersome to calculate accurately, it is substituted in the Steffan-Boltzman equation by either the flame-burst temperature or by the exit gas temperature, and the coefficient C is changed to accommodate the temperature chosen.

Fig. 7 shows the relationship between the flame-burst temperature, the temperature of the heat-absorbing surface, the quantity of generated heat per square foot of effective surface, the quantity of heat absorbed by radation for a given liberation and flame-burst temperature and the theoretical temperature of the gases leaving the radiant heat-

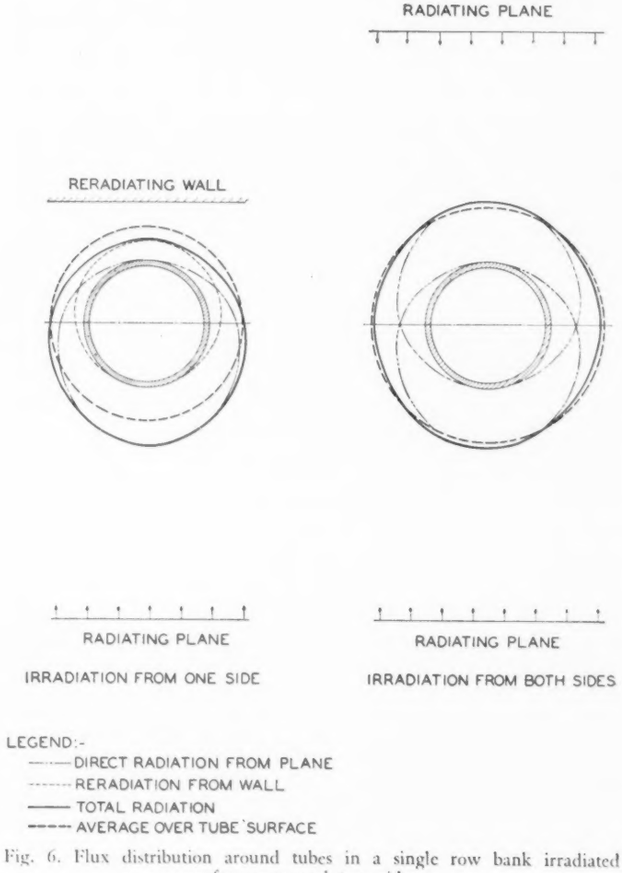


Fig. 6. Flux distribution around tubes in a single row bank irradiated from one and two sides

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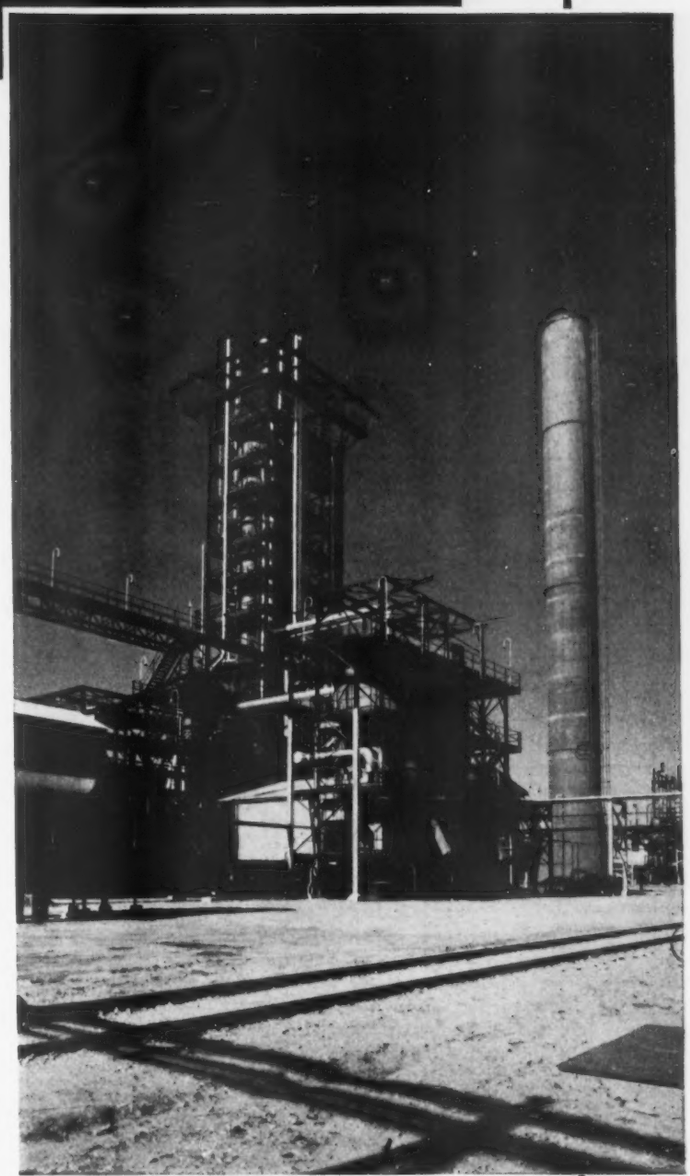

The services of this organization include not only the design and construction of individual units but the recommendation of comprehensive plans for processing available raw materials into marketable products.

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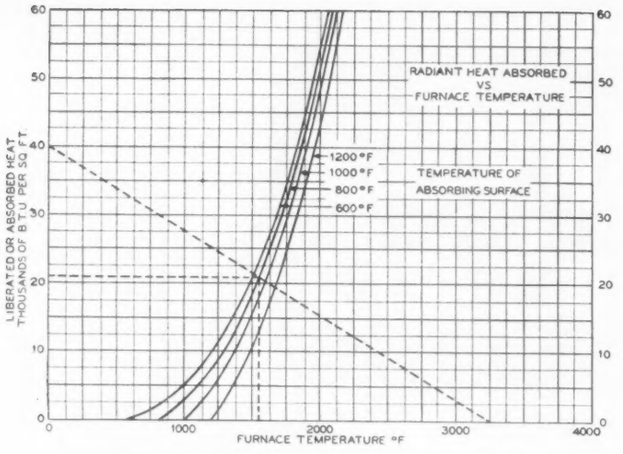

Fig. 7. Radiant heat absorption relationships

Example:

Flame-burst temperature	3200°F.
Liberated Heat/sq. ft. of equivalent effective surface	40,000 B.t.u.
Temp. of Heat-absorbing Surface	800°F.
Absorbed Radiant Heat/sq. ft. of equivalent effective surface	21,000 B.t.u.
Residual Temp. of gases	1550°F.

absorbing chamber, if no convection heat is applied to the surface in the chamber. The curves are derived from the Steffan-Boltzman equation and the relationship between the total available heat, the heat absorbed by radiation, the flame-burst and the mean furnace temperatures—

$$\frac{Q_G}{Q_R} = \frac{T_G - T_F}{T_G - 520}$$

where—

Q_{G^s} is the liberated heat above 60°F. per square foot of effective surface.
Q_{R^s} is the heat absorbed by radiation per square foot of effective surface.
T_G the flame-burst temperature, °Rankin, and
T_F the effective furnace temperature, °Rankin.

Figs. 8 and 9 show the theoretical flame-burst temperature obtained with different amounts of excess air and different air preheats when burning a representative cracking still gas and cracked residue, and may be used with sufficient accuracy in conjunction with Fig. 7 for any cracked gas or cracked residue normally burned in refineries.

The residual heat in the products of combustion leaving the radiant heat-absorbing chamber is recovered either in supplementary tube banks, commonly called convection sections, or in air preheaters. With high inlet oil temperatures, both convection sections and air preheaters are often used, particularly at plants where fuel is sufficiently valuable to justify the installation of air preheaters.

The mechanism of heat transfer in the convection sections is somewhat complex, in that, with the average gas temperatures prevailing in convection sections of modern oil heaters (1300-1800°F. inlet and 800-1100°F. outlet) a portion of the total heat supplied to the convection bank is by

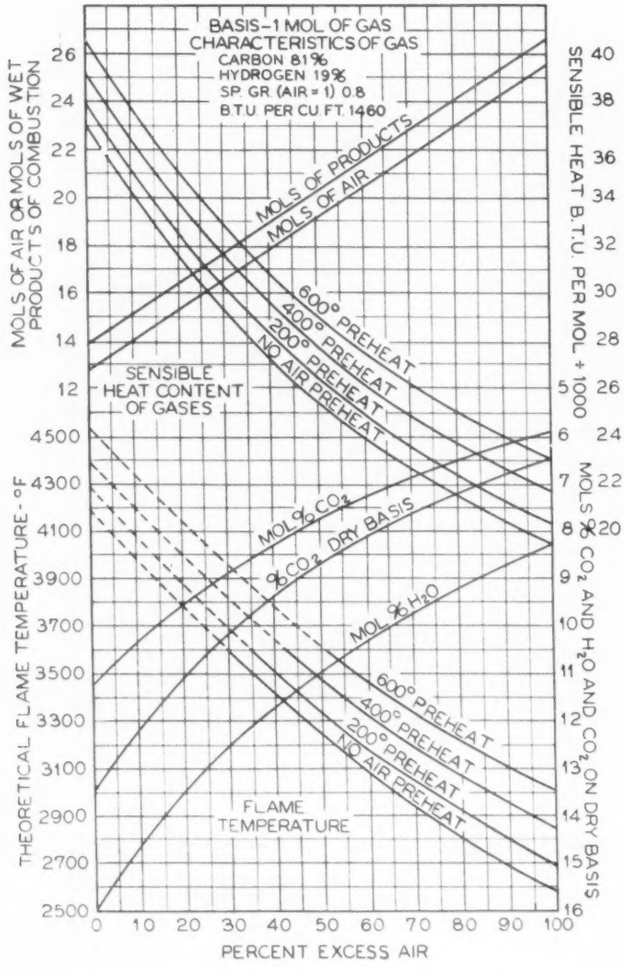
BASIS-1 MOL OF GAS
CHARACTERISTICS OF GAS
CARBON 81%
HYDROGEN 19%
SP. GR. (AIR = 1) 0.8
B.T.U. PER CU. FT. 1460
MOLS OF PRODUCTS
MOLS OF AIR
600° PREHEAT
400° PREHEAT
200° PREHEAT
NO AIR PREHEAT
SENSIBLE HEAT CONTENT OF GASES
MOL % CO2
% CO2 DRY BASIS
MOL % H2O
FLAME TEMPERATURE
MOLS OF AIR OR MOLS OF WET PRODUCTS OF COMBUSTION
THEORETICAL FLAME TEMPERATURE - °F
SENSIBLE HEAT B.T.U. PER MOL + 1000
MOLS % CO2 AND H2O AND CO2 ON DRY BASIS
PERCENT EXCESS AIR

Fig. 8. Combustion characteristics of cracking still gas

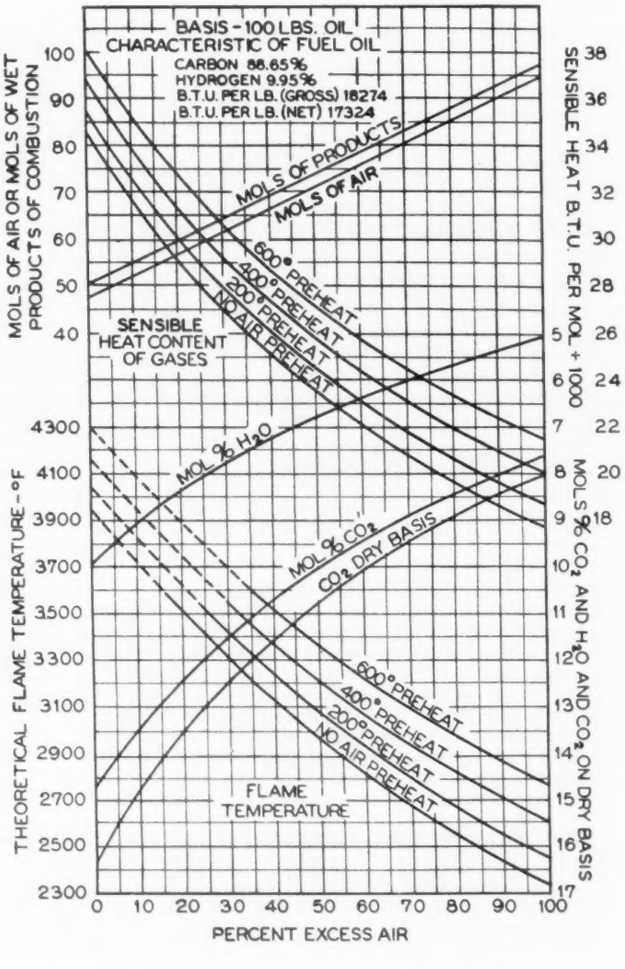
BASIS - 100 LBS. OIL
CHARACTERISTIC OF FUEL OIL
CARBON 88.65%
HYDROGEN 9.95%
B.T.U. PER LB. (GROSS) 18274
B.T.U. PER LB. (NET) 17324
MOLS OF PRODUCTS
MOLS OF AIR
600° PREHEAT
400° PREHEAT
200° PREHEAT
NO AIR PREHEAT
SENSIBLE HEAT CONTENT OF GASES
MOL % H2O
MOL % CO2
CO2 DRY BASIS
FLAME TEMPERATURE
MOLS OF AIR OR MOLS OF WET PRODUCTS OF COMBUSTION
THEORETICAL FLAME TEMPERATURE - °F
SENSIBLE HEAT B.T.U. PER MOL + 1000
MOLS % CO2 AND H2O AND CO2 ON DRY BASIS
PERCENT EXCESS AIR

Fig. 9. Combustion characteristics of cracked residuum

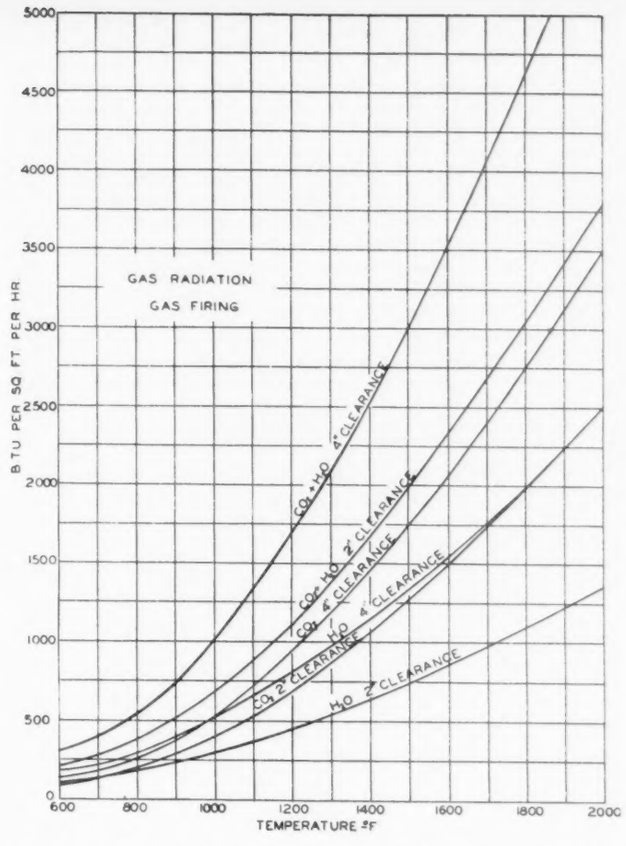

Fig. 10. Radiant heat absorption from products of combustion of cracking still gas

Example:

Gas temperature	1600°F.
Surface temperature	800°F.
Clearance between tubes	4"

Total radiation from CO_2 and H_2O
3550 (at 1600) — 550 (at 800) = 3000 B.t.u./sq. ft.

radiation from the gases, the amount depending on the gas temperature, the CO_2 and H_2O content of the gases and the clearance between the tubes which determines the shape factor of the radiating gas layer.

Figs. 10 and 11 show the radiant heat absorption from products of combustion when burning gas and oil fuel, as in Figs. 8 and 9, with 50 per cent excess air and clearances of 2 inches between the tubes (shape factor approximately 2.8). For example, the radiant heat transfer from gases at 1330°F. to tubes with a metal temperature will be (from Fig. 10):

2200	—	630	=	1570 B.t.u./sq. ft./hr.
Radiation from gases to tubes		Re-radiation from tubes to gases		Net radiation to tubes

for gas fired heaters and similarly (from Fig. 11):

$$1900 - 550 = 1450 \text{ B.t.u./sq. ft./hr.}$$

for oil fired heaters.

The purely convection heat transfer in convection sections can be expressed by the formula—

$$Q = T_M h_c$$

where—

Q = heat transfer, B.t.u./sq. ft./hr.
T_M = the mean log temperature difference of the gases and the outside metal temperature, degrees F.,
h_c = the coefficient of heat transfer, which according to an empirical formula proposed by Monrad is—

$$\frac{1.6G^{2/3}T^{0.3}}{D^{1/3}}$$

where—

G = mass velocity of the gases, in the minimum cross section lbs./sec./sq. ft.
T = temperature of the gases, °Rankin.
D = diameter of tubes, inches.

Depending on the above factors, h_c varies between 2 and 4 B.t.u./sq. ft./hr. per degree M.L.T.D and represents 30-60 per cent of the overall heat transfer coefficient in an average convection section.

Modern petroleum heaters are, as a general rule, designed to meet definite service requirements covering not only total heat load, thermal efficiency and performance of the heat-absorbing surface, but heat distribution and the time-temperature effect in the heater most suitable for the operation and the charging stock involved. The time-temperature effect, which determines the degree of decomposition of the material heated, is often the most important service requirement and operating factor. Petroleum heaters can be divided into three main groups, according to the amount of decomposition obtained—

1. Heaters used for heating only with little or no decomposition.
2. Heaters where in addition to the heating, substantially all of the decomposition desired for the refining process is obtained in the heater.
3. Heaters where only partial decomposition is obtained in the heater, with the remainder of the reaction being carried out in reaction chambers or soaking drums, usually not heated externally.

Heaters of the first group are designed to obtain minimum time-temperature effect with the maximum temperature employed and are used for non-destructive distillation where no chemical change of the overhead and residual products is desired, such as topping, atmospheric or vacuum distillation, rerunning, etc.

Heaters of the second group are designed to give maximum time-temperature effect at the highest operating temperature employed, and are used with cracking units for the lighter overhead stocks where no reaction chamber is employed. These heaters are usually so designed that the heating surface nearest the heater outlet is subjected to lower rates of heat input than the rest of the tube bank to provide a reaction or "soaking" section in the heater, where very little or no increase in temperature is obtained.

Heaters of the third group are the most difficult to de-

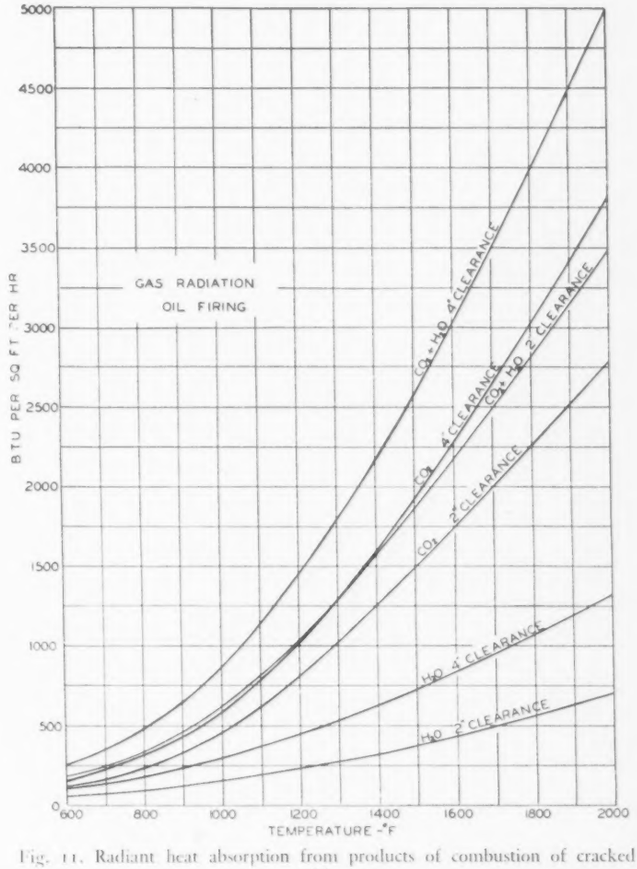

Fig. 11. Radiant heat absorption from products of combustion of cracked residuum

sign, particularly for residual cracking stocks which are highly sensitive to thermal treatment. These heaters must be designed for a time-temperature effect that will permit highest coil outlet temperatures, and consequently highest reaction chamber temperatures to assure effective operation of the chamber, without excessive decomposition and the resultant coke deposition in the coil.

With given cracking stocks, definite inlet and outlet pressures and temperatures and definite quantities of material going through the heater, the time-temperature effect of a heater is closely related to its temperature curve or "heating curve," obtained by plotting the temperature of oil against either the length, the heating surface, or the volume of the coil. Since the heating curve of a heater is determined by the relationship between the heat requirements of the oil and the rates of heat transfer at any point of the coil, the type of heating curve obtained in a heater is one of its main characteristics.

As a general rule, the specific heats of hydrocarbons increase with temperature so that the sensible heat requirements per degree temperature rise are increased as the oil travels through the coil. When change of phase occurs during heating, the increasing sensible heat requirements are augmented by increasing amounts of latent heat of evaporation. If decomposition occurs during heating, resulting in conversion predominately into lighter fractions, as is the case with cracking, the heat requirements are further increased by the heat of reactions and the higher specific heat and latent heat of evaporation of the lighter constituents formed. In some instances, the heat requirements per degree temperature rise at the end of the coil are many times the requirements at the beginning of the coil, in which case, to obtain a uniform temperature rise throughout, it is necessary to apply at the end of the coil heat input rates many times the rates at the beginning of the coil.

Fig. 12 shows the most common types of heating curves obtained with different relationships of heat requirements and rates of heat input in the coil. While smooth heating curves are actually obtained in most heaters, the change of heat transfer rates may be quite abrupt from zone to zone, and the actual heat input rate curves of a heater may consist of a series of steps rather than the smooth curves or straight lines used to illustrate the typical relationships on Fig. 12.

Heating curve 12A is obtained when the heat input into the oil increases at a greater rate than the heat requirements of the oil as it passes through the coil. When the heat input increases at the same rate as the heat require-

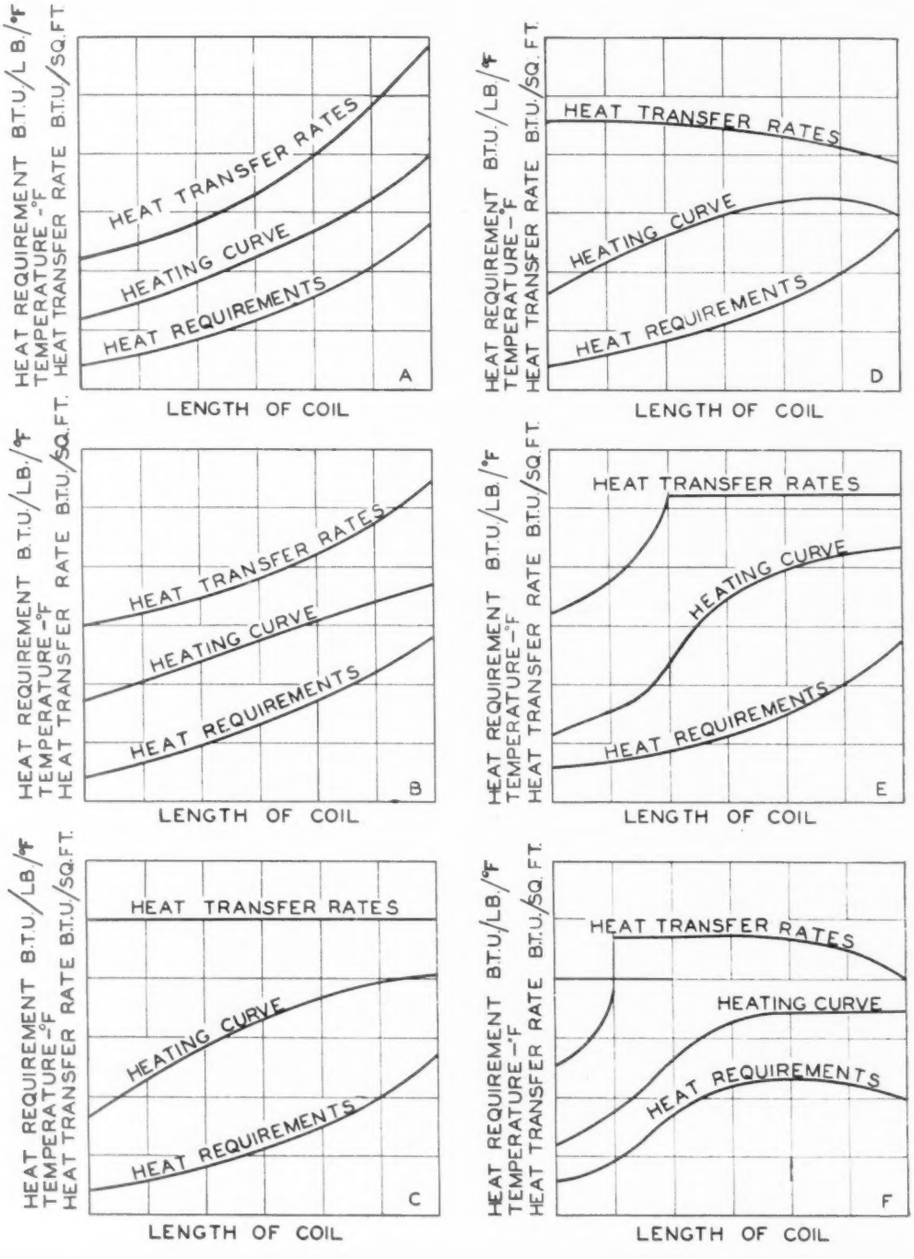

Fig. 12. Relationships between heat requirements, heat transfer rates and heating curve

ment of the oil as it passes through the coil, heating curve 12B is obtained. Heating curve 12C is obtained with increasing heat requirements and uniform rates of heat transfer sufficiently high to maintain some temperature rise of the oil through the coil. With increasing heat requirements and decreasing rates of heat input, heating curve 12D is obtained. The same type of heating curve may be obtained with uniform heat input rates and increasing heat requirements if the rates are sufficient to maintain a temperature rise of the oil only through the lower temperature range where the heat requirements are comparatively low.

The coils of most commercial heaters can be represented as a series of sections with one of the above heating curves. A bare tube convection section with countercurrent flow of comparatively high temperature gases and comparatively low temperature oil normally has a heating curve as shown on 12A; with higher oil temperatures, the heating curve may be as 12A in the bottom section and as 12B in the top section; with concurrent flow of comparatively high temperature gases and high temperature oil, a heating curve as shown on 12D may be obtained. Radiant sections with substantially uniform rates of heat transfer normally have a heating curve as shown on 12C.

In a heater where the oil passes first countercurrently through a convection section and then through a radiant section with substantially uniform and comparatively high rates of heat input, a heating curve as shown on 12E is normally obtained. This curve is a composite of curve 12A for the convection section and curve 12C for the radiant bank. In many group 2 heaters, where the temperature through the "soaking section" is maintained substantially constant, and where the heat of reaction is the determining factor of the heat requirements, a relationship of heat transfer rates, heat requirements and heating curve as shown on 12F may be obtained, particularly if the "soaking section" is located in a convection section with concurrent flow of oil and gases, or in a separately fired combustion chamber with lower average rates of heat input toward the end of the "soaking section."

A properly designed heater, particularly a heater intended for group 2 or group 3 service, must have a relationship of heat transfer rates and heat requirements that will produce a heating curve corresponding to the time-temperature effect most suitable for the service intended. Failure to design a heater for this service with this proper relationship may result in the heater becoming the limiting factor of the whole unit, in that the unit may have to be operated only a certain way to keep to a minimum troubles with the heater, such as local overheating, coke deposition in certain sections of the coil because of poor time-temperature relationship in the coil, low conversion per pass, etc.

Design of heaters to meet specific time-temperature relationships is a comparatively recent development and the data for such design are as yet a jealously guarded secret of the organizations engaged in this specialized work. However, the most commonly used petroleum heaters have certain basic characteristics which define them as a heating apparatus and which affect them in their ability to meet the various time-temperature relationships desired in petroleum refining.

Fig. 13 shows a flue gas recirculating heater of a type widely used in petroleum refining. In this heater the fresh products of combustion generated in the combustion chamber are mixed with flue gases withdrawn from the flue to the stack by means of a flue gas recirculating fan, and distributed along the length of the heater through openings in a distributing duct. Normally a recirculating ratio (pounds of recirculated gases /pound of fresh products of combustion) of 1.5 to 3.5 is used to reduce the temperature above the tubes. Average rates of 8000-9000 B.t.u. per square foot of inside surface can be obtained in such heaters with countercurrent flow of oil and the products of combustion with gas temperatures of 1450-1500°F. above the tubes and 1200°F. below the tubes when heating oil from 750-800°F. to 920-940°F.

With recirculating ratios below 2, and with countercurrent flow of gases and the oil, a heating curve as shown on 12A can be obtained. With increased recirculating ratios, this heater can be operated to give heating curves as shown on 12B and 12C, the latter only with high oil outlet and comparatively low gas inlet temperature and gas recirculating ratios of the order of 4:1. As a general rule, heaters of this type were used for group 3 service and a number of them are still in operation.

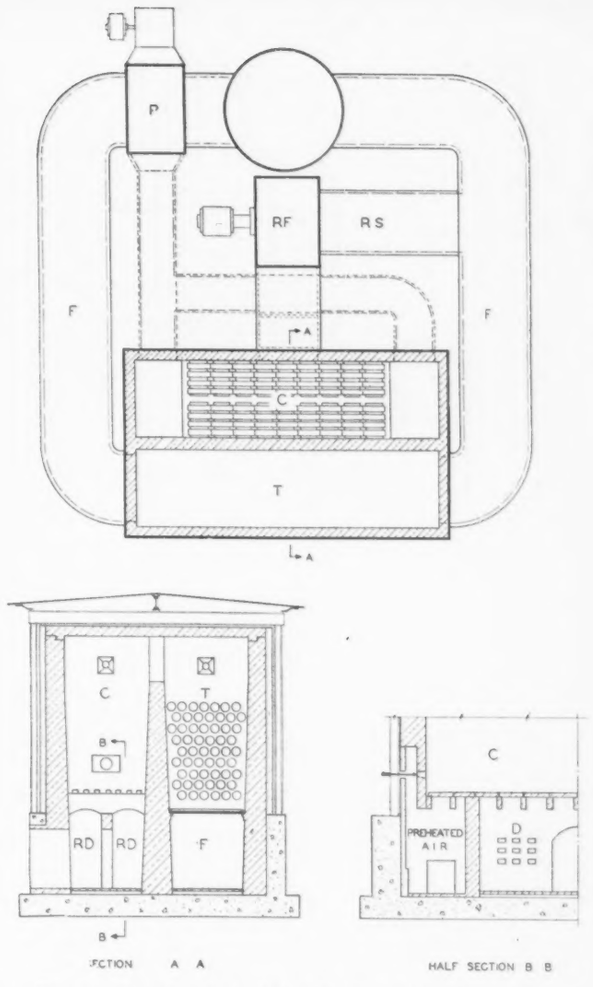

Fig. 13. Flue Gas Recirculating Furnace with Air preheater C—Combustion chamber; T—Tube or heating chamber; F—Flue to stack; RF—Recirculating fan; RD—Recirculating gas distributing duct; RS—Recirculating fan suction duct; P—Air preheater

Fig. 14 shows another type of flue gas recirculating heater where the recirculated gases are introduced through the bridge wall directly from the tube chamber to the combustion chamber without auxiliary flues. A number of small fans as shown, or steam injector jets are used for flue gas recirculation.

Fig. 15 shows an early shielded radiant heat oil heater in which a roof bank was installed to absorb sufficient radiant heat from the products of combustion before they enter the "main" or the convection bank of the heater, to permit their safe use in this bank without flue gas recirculation or high amounts of excess air. To protect the relatively small number of the tubes in the roof bank from the full radiation in the combustion chamber, the portion of the tubes over the combustion chamber where radiation was the most intense was covered with ceramic enclosures. Cast-iron enclosures were used on the portion over the main bank where radiation was comparatively low. Comparatively high amounts of excess air (100-150 per cent) had to be used in this heater to reduce the temperature of the gases entering the main bank, when the heater was operated at high enough capacities effectively to utilize all of the surface in the main bank. This heater was used

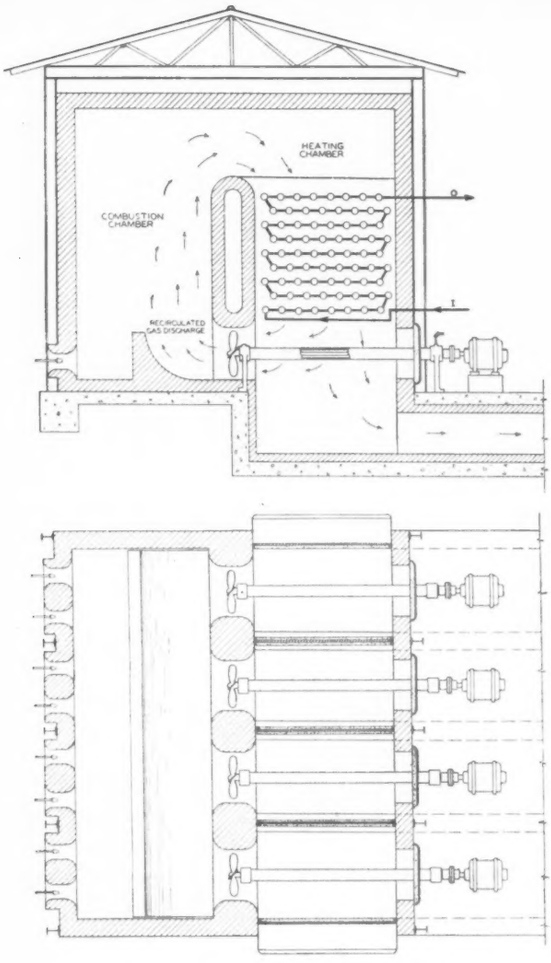

Fig. 14. Flue gas recirculating furnace
I—oil inlet; O—Oil outlet

closures. The heater was intended for operation with low excess air to obtain high flame-burst temperatures and the highest radiation through the carborundum. With the flow as shown, the heater was primarily used for group 2 service to give a heating curve substantially as shown on Fig. 12F.

Fig. 17 shows an early open flame radiant heat oil heater with a much larger combustion chamber than that of the heater shown on Fig. 15, and with approximately one-half of the total tube bank located along the roof of the combustion chamber to permit the use of bare radiant heating tubes and open flames. With two rows of tubes and the flow as shown, this heater is used for group 1 and group 3 service. A heating curve intermediate between that shown on 12E and 12F is normally obtained. With the reversed flow through the two-row roof bank, that is, with the oil entering the second row and leaving through the first, a heating curve intermediate between 12B and 12C is normally obtained in the radiant tubes. With three or more rows of tubes in the roof bank and

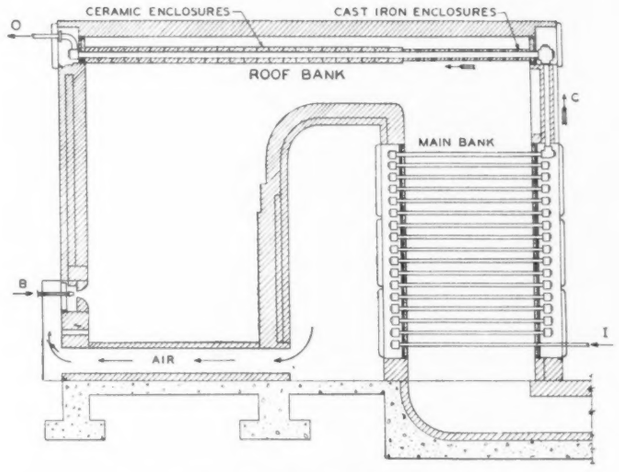

Fig. 15. Early shielded tube radiant heat oil heater
I—Oil inlet; O—Oil outlet; C—Outside cross-over; B—Burners

for group 1 service and had a heating curve similar to that shown on Fig. 12C.

Fig. 16 shows another type of an early shielded radiant heat oil heater where shielding enclosures or "muffles" were placed around the flames and the products of combustion to protect from direct radiation the comparatively small amount of radiant heat-absorbing surface used. Because of the high temperature to which the enclosures were subjected and to obtain comparatively high rates of heat transfer through these enclosures to the radiant tubes, carborundum was used for the en-

with the oil entering the lowest row and leaving from the highest row, this heater is used for group 2 service and gives an overall heating curve approaching that shown on Fig. 12F.

Fig. 18 shows an open flame heater with radiant heat-absorbing tubes along the roof and at least two walls of the combustion chamber. With the flow as shown, this heater is used for group 2 service with kerosine and other light distillates, and for group 3 service with heavier overhead products such as gas oil. The heat-

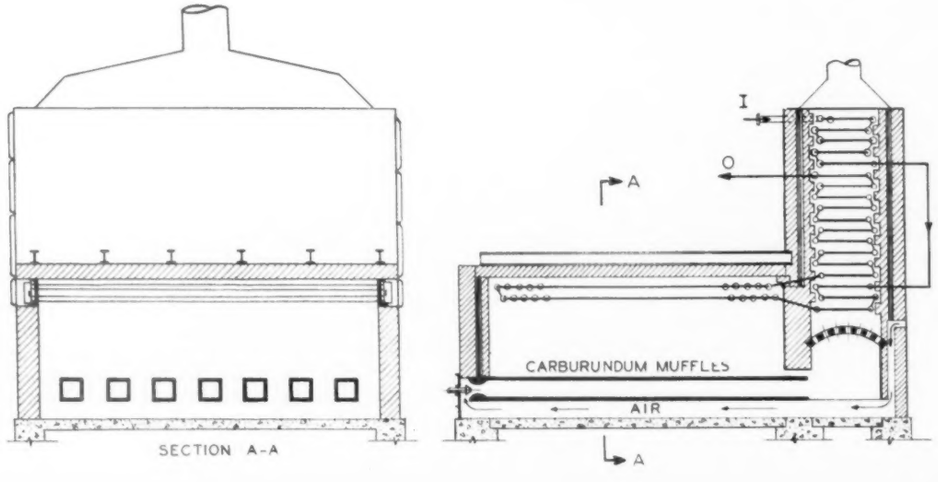

Fig. 16. Early shielded flame radiant heat oil heater
I—Oil inlet; O—Oil outlet; C—Outside cross-over

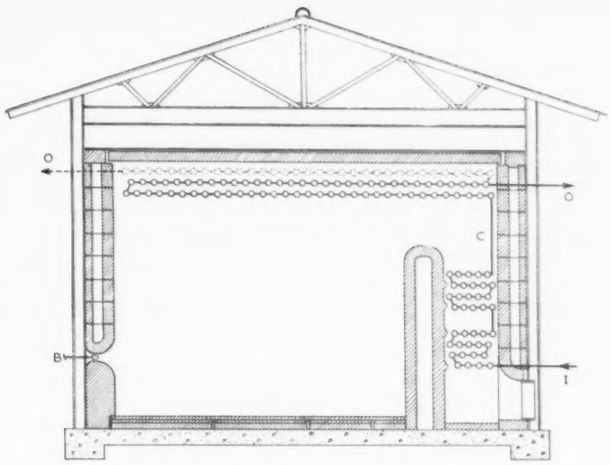

Fig. 17. Early open-flame heater with roof tubes only

Fraction cold	0.26
Effectiveness of circumferential surface from Fig. 4	0.16

I—Oil inlet; O—Oil outlet; B—Burners

ing curve obtained is approximately that shown on 12F.

Fig. 19 shows a partially shielded flame heater where the muffles shield only a small portion of the flames and act more for promoting and completing combustion than as shields between the flames and the tubes. Approximately 75 per cent of the total surface is exposed to radiation and the floor and the back walls of the heater, in addition to the roof, are covered with tubes. This heater is used for group 3 service and with comparatively low average rates of heat transfer (8000-9000 B.t.u./sq. ft./hr.) in the "radiant" section, gives a heating curve intermediate between 12B and 12C in this section. With higher average rates, the back wall and the roof tubes of the heater which are subjected to both radiant and convection heat transfer operate at considerably higher heat input rates than the floor tubes, so that a heating curve approaching that shown on 12D may be obtained through the "radiant" section.

Fig. 20 shows an early down-draft heater consisting of a vertical cylindrical section with the tubes placed along the whole circumference of this section, a secondary horizontal cylindrical section with tubes located along the lower half of this section, and a convection section. No air preheater was generally used. The heater as shown was used for group 3 service and gave a heating curve of the type shown on Fig. 12E. The later design down-draft heaters consist only of a vertical cylindrical section and an air preheater. They are also used for group 3 service and give a heating curve of the type shown on Fig. 12C.

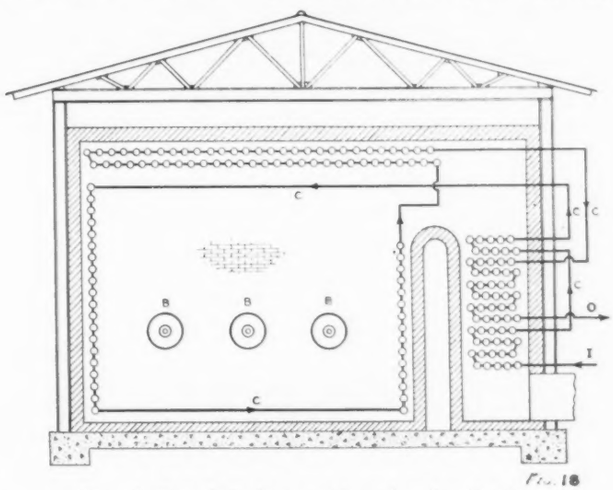

Fig. 18. Open-flame heater with roof and wall tubes

Fraction cold	0.50
Effectiveness of circumferential surface of wall tubes from Fig. 4	0.170
Effectiveness of circumferential surface of roof tubes from Fig. 4	0.085

I—Oil inlet; O—Oil outlet; C—Outside cross-overs; B—Burners

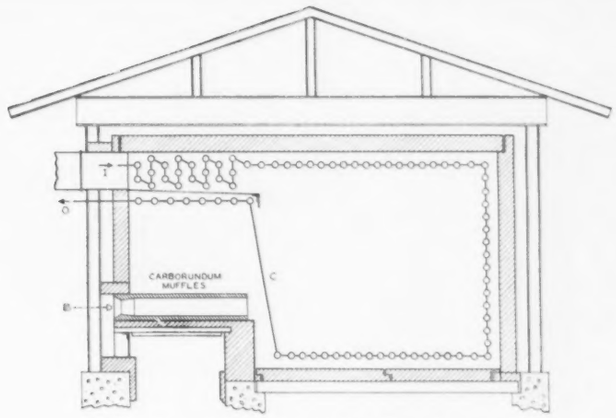

Fig. 19. Partially shielded flame heater

Fraction cold	0.61
Effectiveness of circumferential surface from Fig. 4	0.14

I—Oil inlet; O—Oil outlet; C—Outside cross-over; B—Burners

Fig. 21 shows an updraft heater of the same general type as Fig. 20. The convection section when used is very small, and an alloy air preheater is usually employed to reduce the temperature of the gases going to the stack. This heater is used primarily for group 3 service and gives a heating curve of the type shown on Fig. 12C.

The heaters shown on Figs. 15 to 21 inclusive represent the complete range of proportions of radiant heat-absorbing surface to total surface used and vary from a cold fraction of less than one-sixth for the heater shown on Fig. 15 to a cold fraction of five-sixths for the heater on Fig. 21, with the relative effectiveness of the radiant heat-absorbing surface varying from 0.35 to 0.06. The heaters shown on Fig. 15 and 16 have too little radiant heat-absorbing surface, so that shielding of the surface

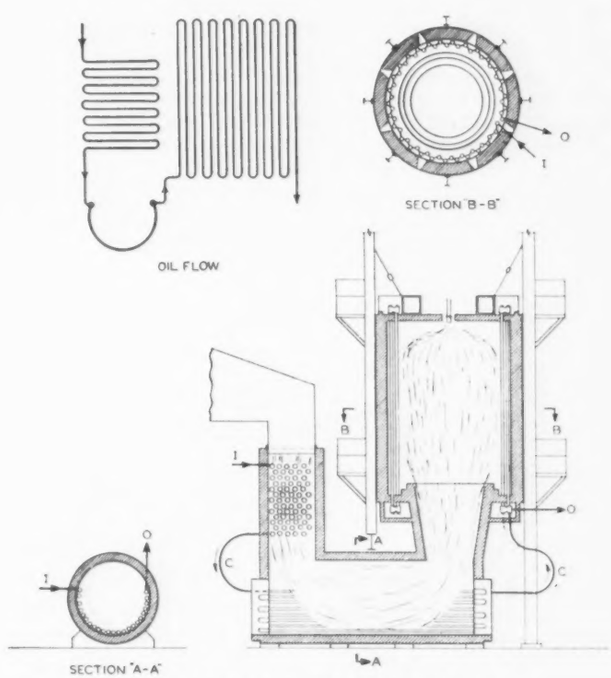

Fig. 20. Early down-draft cylindrical heater

Fraction cold	0.79
Effectiveness of circumferential surface of vertical cylindrical section from Fig. 4	0.06

I—Oil inlet; O—Oil outlet; C—Outside cross-overs

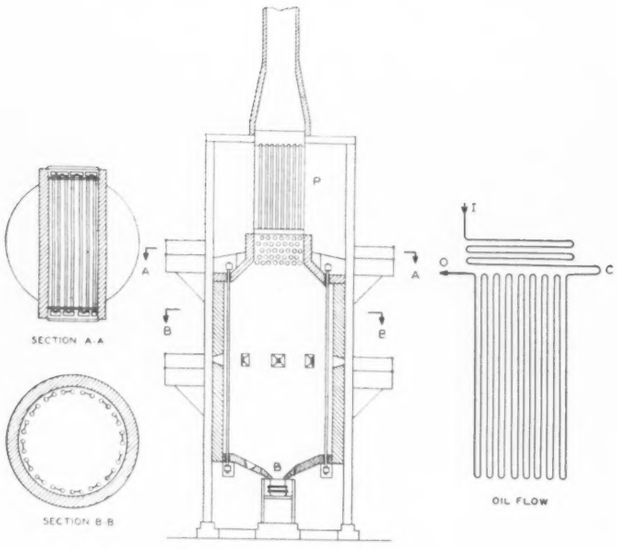

Fig. 21. Updraft cylindrical heater

Fraction cold	0.85
Effectiveness of circumferential surface from Fig. 4	0.06

I—Oil inlet; O—Oil outlet; B—Burner; P—Air preheater

was required to protect these tubes from excessive rates, overheating of the tubes, coke deposition in the tubes and their eventual burning out. The heater shown on Fig. 21 has too much radiant heat-absorbing surface in proportion to the furnace envelope, with the result that the effectiveness of the surface is comparatively low, unless the gases are made to wash the upper portion of the tubes to supply an appreciable amount of purely convection heat to these tubes.

Fig. 22 shows a heater with approximately 50 per cent of the total heat-absorbing surface located along the roof and the floor of the combustion chamber. The tube banks in the combustion chamber form approximately two-fifths of the area of the furnace envelope. With single rows of tubes used in the combustion chamber, the optimum effectiveness of the circumferential area of tubes irradiated from one side is obtained. As a general rule, the floor tubes of the heater are the tubes of the highest rates of heat input, and with the flow as shown, a heating curve similar to 12E but with a somewhat steeper rise toward the end of the coil is normally obtained. This type of heater is used on cracking units for group 3 service, particularly when processing heavy residual oils.

The heaters shown on Figs. 15-21 have a fixed heat distribution and with a given quality and quantity of the material heated and definite inlet and outlet pressures and temperatures, are rather inflexible as to the type of heating curve and the time-temperature effect obtained. Anything more than a minor variation in the heating curve requires a rearrangement of tubes.

The heater on Fig. 22 can be operated to obtain a limited control of the heating curve by changing the character of the flame and therefore the relative rates of heat input into the convection section, the roof tubes and the floor tubes of the heater. The burners fire through three compartment firing tunnels, of which the center tunnel F is the firing tunnel proper and the upper and lower tunnels A and B are for admission of secondary air to the fuel after its ignition in tunnel F. With all the air passing through compartment F as primary air, and short non-luminous flames, the rates of heat input into the floor tubes and the roof tubes near the firing wall are proportionally lower, and the rates of heat input into the convection section and the roof tubes over the bridge wall and near the back wall of the heater are proportionally higher than if only a portion of the air is sent through compartment F and the rest of the air used as secondary air through compartments A and B to produce luminous flames.

Restricting the flow of air through compartment F and admitting a large portion of the air as secondary through compartment A, produces semi-luminous flames

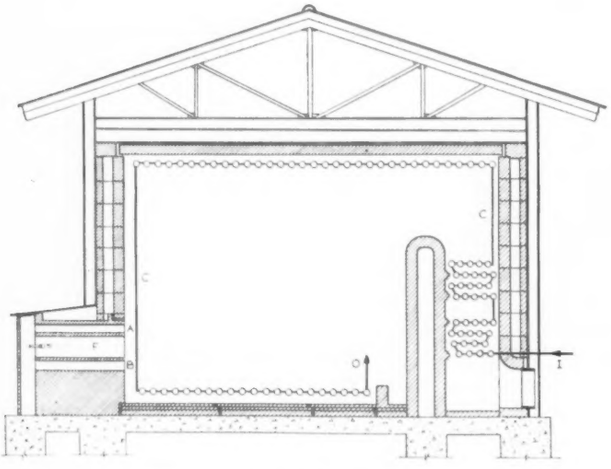

Fig. 22. Roof and floor tube heater

Fraction cold	0.41
Effectiveness of circumferential surface from Fig. 4	0.20

I—Oil inlet; O—Oil outlet; C—Outside cross-over

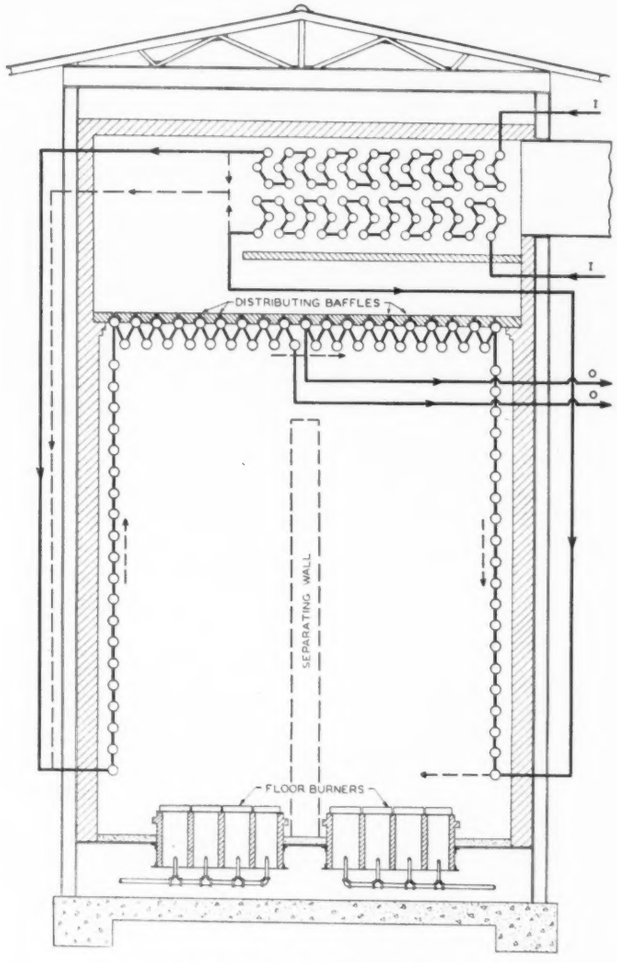

Fig. 23. Updraft rectangular heater

Fraction cold	0.60
Effectiveness of circumferential surface of wall tubes from Fig. 4	0.145
Effectiveness of circumferential surface of roof tubes from Fig. 4	0.075

I—Oil inlet; O—Oil outlet

with a hotter face toward the floor tubes. Admitting the secondary air through compartment B gives a semi-luminous flame with a hotter face toward the roof tubes. The heating curve for the complete coil of this heater can therefore be varied from that as shown on 12E to a composite of heating curve 12A for the convection section and heating curves 12B or 12C for either the floor or the roof tubes.

Fig. 23 shows an updraft rectangular heater in which the radiant heat absorbing surface is located along the roof and the side walls of the heater, with the tubes in the roof subject to both radiant heat and fluid heat from the gases passing to the convection section. Special tile is placed over the top row of the roof tubes to act as distributing baffles and to direct the gases at high velocities along the shielded faces of these tubes, so as to impart a high convection component to the shielded faces and partially equalize the heat pickup along the circumference of the top row of the roof tubes. The parallel flow arrangement is used primarily with larger capacities for group 3 service where a single coil would not give the desired time-temperature relationship. The series flow arrangement as shown in dotted lines is used for group 2 or 3 service with the lighter overhead cracking stocks, or for group 2 service with gasoline and naphtha reforming.

By changing the type and rate of firing of the two sets of burners in the combustion chamber a wider variation in heating curve can be obtained in this heater than in the heater shown on Fig. 22. If a separating wall is installed in this heater, as shown in dotted lines, to divide the combustion chamber into practically two separate compartments a wide range of heating curves may be obtained in this heater. Because of the relative flexibility of firing, this type of heater once installed may be used without changes for a wider range of charging stocks than the heaters shown on Figs. 15-22 inclusive, since the heating curve in this heater may be changed to obtain the desired time-temperature effect for the stock processed.

However, with the tube distribution used and the comparatively high cold fraction of the heater, even if a separating wall is installed, this heater is limited to comparatively low average rates of heat input, which makes it suitable primarily for processing overhead products for group 2 and group 3 service.

Fig. 24 shows a 2-compartment heater often referred to as the double end-fired heater. In this heater the two combustion chambers are completely separated and the floor and roof tubes of one chamber function wholly independent of those in the other chamber, providing more definite control of the heating curve than that which could be obtained in the heater shown on Fig. 23. This heater is used with either parallel flow, as shown in solid lines, for processing two streams of oil, or with a single flow in series through both compartments, as shown in dotted lines. The heater has a comparatively low cold fraction and can be designed for comparatively high rates of heat input. The heater is used for group 2 and 3 service on a variety of overhead and residual cracking stocks.

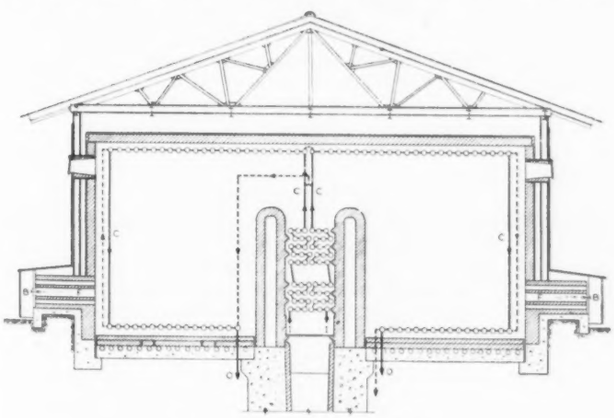

Fig. 24. Two compartment heater

Fraction cold	0.42
Effectiveness of circumferential surface from Fig. 4	0.19

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(*See also page 56*)

The heaters on Figs. 17 to 24 employ irradiation of tubes from one side only and, therefore, are subject to the limitations as covered by the discussion of Figs. 5 and 6. The heaters shown on Figs 17 to 22, inclusive, are limited to and are normally used for processing single streams. The heaters shown on Figs. 23 and 24, and modifications of heaters as shown on Figs. 20 and 21, may be arranged for processing a maximum of two parallel streams to obtain identical thermal treatment of the oil in the streams.

There is a limit to the size of tube and length of coil that can be used and still maintain the desired range of the relationships between the quantity of the material heated; the amount of heat-absorbing surface of the coil; the permissible heat transfer rates which determine the amount of surface; the oil velocities which affect the permissible rates and determine the time in the coil with a given physical state of material passing through it; the pressure drop through the coil, which is determined by the inside diameter of the tubes, the quantity of the material passing through the coil and its length, and which in turn affects the physical state of the material, the actual velocity, and the time in the coil. Some of these factors, such as heating surface, are functions of the first power of the outside diameter and the length of the coil; some, such as mass velocity and average linear velocity, are functions of the square of the inside diameter only; while others, such as pressure drop, are functions of length of the coil and the fifth power of the inside diameter.

END OF PART I

(To be Concluded in an early issue)

Activities OF EQUIPMENT MANUFACTURERS

STOCK LIST—Wyatt Metal & Boiler Works, Dallas, has published a stock list showing items which the firm carries in stock at its Dallas and Houston plants for the oil industry.

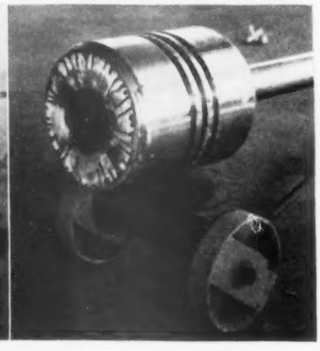
Sizes and specifications are given for all items carried such as structural, boiler, floor and tank plates, sheets, beams, channels, angles, bars, flanged and dished heads, cylindrical shells, tubular goods, tankage, flanges, manholes, nozzles, smokestacks etc.

Description is given of the items manufactured to order including boilers, heat exchangers, pressure vessels and other refinery equipment.

* * *

PISTON WELDED—The 13.5-inch diameter gas compressor piston illustrated herewith was rebuilt by resurfacing with weld metal in a special preheating furnace and machining down to the original dimensions. Since the piston was made of cast iron, it had to be preheated thoroughly before welding. The preheating furnace developed for this work is fired with natural gas and arranged so that the piston could be turned while welding. When the welding was finished the furnace lid was replaced, the casting reheated evenly and then cooled off slowly. The cost of reclaiming

Two men apply weld metal to a compressor piston simultaneously on opposite sides of this piston preheating furnace



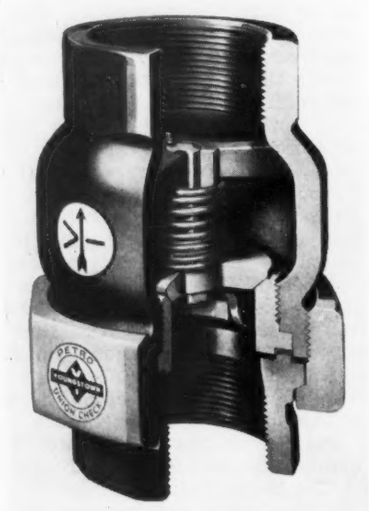
The completed rebuilt gas compressor or piston after machining of weld metal down to the original dimensions

one piston was about $75 as compared to $200 for a new one, according to Oxy-Acetylene Tips, a publication of The Linde Air Products Co., 205 East 42nd St., New York.

Equipment used in making the welds were two Oxweld type W-17 welding blowpipes with removable tips handled by two welders simultaneously. Forty-nine pounds of Oxweld No. 25M. patented bronze rod alloyed with silicon were used in the rebuilding operation. The piston, 13½ inches in diameter and 16 inches long is used at a natural gas pipe line booster station. It will wear as long or longer than a new piston, it is claimed.

* * *

UNION CHECK VALVE—A spring-controlled, forged steel union check valve for the petroleum industry is announced by the Youngstown Sheel & Tube Co. Designed to handle full pipe capacity, the valve is built for up to 600 pounds steam working pressure or 2000 pounds cold work-



ing pressure. The spring controls the opening and closing of the valve in accordance with the velocity of the flow yet is so designed it is not affected by sudden fluctuations of flow or back pressure, it is said. Three sizes are for 2, 2½, and 3-inch pipe. These are furnished with either standard or handle bar nut.

* * *

CHECK VALVES—Two basic types of check valves and their applications are discussed in Crane Co.'s new booklet, "Checking Up On Check Valves," available from that company at 836 Michigan Ave., Chicago. Do's and Don't's are listed and cross-sectonal views are included showing the construction of different Crane check valves.

* * *

RESIN PLANT—Shawinigan Resins Corp. has begun operation of a new vinyl acetate resin plant at Indian Orchard, Mass. The new plant will produce binder for safety glass. It is owned jointly by Shawinigan Chemicals Ltd., of Montreal, and Monsanto Chemical Co. of St. Louis.

The entirely new design for its service stations adopted by Humble Oil & Refining Co. of Houston provides new features to meet today's needs in serving the motoring public, a principal one being the location of the station sales and product display room on the pump island and, entirely removed from the station building

Sales Room Moves to Island

An entirely new design for oil company service stations, adopted recently by Humble Oil & Refining Co. of Houston, embodies these important features:

1—Sales room and product display room has been located at the point of sale on the pump island.

2—The fan-shape building design provides that attendants can survey the entire premises from the pump island sales room.

3—Lubrication and other car servicing is provided for in a continuous tunnel at the rear of the station building.

4—Spacious rest rooms and toilets are located on each side of the building, with outside entrances visible but not conspicuous from the drives.

IN THE new service station design adopted by Humble Oil & Refining Co. of Houston, the sales office and product display room is located on the pump island and is the focal point from which the rest of the station and grounds can be easily surveyed by the attendants.

The ground plan of the station is fan-shaped, as is shown in an accompanying drawing, the pump island as a unit including the sales room, forming the apex. That portion of the station building adjoining the drive houses the equipment and products stock and also the spacious rest rooms, each of which opens at the side of the building rather than on the drive.

The rear portion of the station building is in effect a tunnel, open at each end. Here the lubrication, washing and other servicing is given. The building design provides for ease of entrance and exit from the servicing department, as easy as to the pump island and yet cars visiting the station for servicing are entirely removed from the pump island trade.

The new type of station design was adopted by the Humble company to achieve certain definite ends which it was felt would help to meet the trend in serving the motorist at the oil company station. Greater accessibility of the station attendant was provided by putting the station office on the pump island and his merchandising of the line of goods carried was helped by having the complete display on the island, rather than in a station building removed from the primary point of sale.

The new design also provides for more space for rest rooms, with their entrances more inconspicuously located than when the door opens on the drive or on the interior of the station office. Also more privacy is insured through this section of the station building being but little used by the station crew.

On account of the comparatively large amount of plate glass and stainless steel used in the construction of the new type of station, its cost is said

to be between 15 and 20 per cent more than for otherwise similar stations of the same relative size.

Officials of the Humble company say that the public reaction is very favorable to the first of this new type of station, which is located at West Gray and McDuffie streets in Houston, and it is now anticipated that only minor changes will be made in future stations to be built under these plans. Relatively few changes had been made in the general design of Humble service stations for some ten years, but nevertheless, study of station design had been carried on, since it was recognized that the design must sooner or later be changed to keep pace with the general advancement in automotive requirements and public demand.

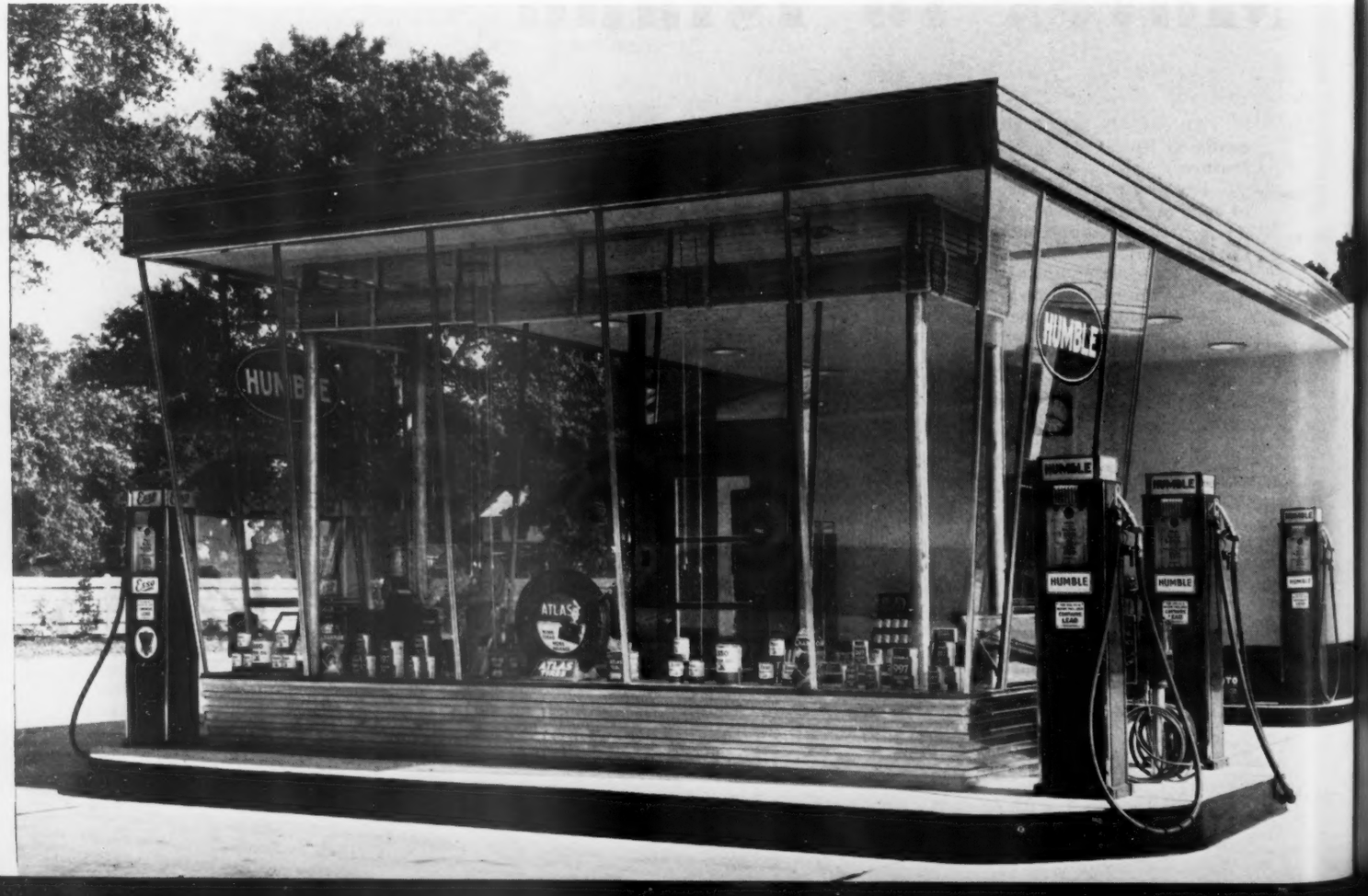
"At the outset we recognized the old adage, 'Goods Well Displayed Are Half Sold'," stated Stuart A. Giraud, chairman of the manufacturing and marketing committees of the company, in commenting on the new type of station, "and we realized that the closer our merchandise could be displayed to the passing motorist or pedestrian the more apt we were to sell it.

"We were also convinced that the more accessible the service station attendant could be to his customers the more expeditiously they could be served; therefore, a glass enclosed, combination office and product display room. We were also convinced that the more the service station attendant could survey the rest rooms, automotive lubrication and washing facilities and the premises otherwise, the better control he would be able to exercise over all the operations and the better service he could render; therefore, the fan-shaped building, enclosing equipment, product storage, rest rooms and the automotive and lubrication tunnel."

One entrance to the U-shaped, continuous tunnel at the rear of the station building, in which lubrication and other car servicing is carried on

The dominating feature of the new Humble station is the combination office and product display room which is centered on the pump island with space left on the island on all sides. This enclosure is primarily of plate glass, the roof being supported by four four-inch galvanized iron pipe. The 22-inch high outside base of this room is of stainless steel, as is the facia around the roof line of the main building, canopy and office and product display room. A further modernistic touch is given by the plate glass walls slanting in from the top to the base. Venetian blinds are provided for the occasions

The stainless steel and plate glass sales and product display room in Humble's new design of service station, located on the pump island to provide for greater accessibility of station attendant and his merchandise to the customer



Rest room interior of the Humble's new station. Floors are frosted white tile and walls to a height of over six feet, trimmed in blue. The mirror over the wash basin is full width of the wall. Toilets are in separate rooms

rooms which in many instances are better than those in their own homes, considerable attention was given by the Humble company, in the design of its new type station, to the arrangement, design and equipment of these facilities. Both have outside entrances on opposite sides of the station building, with entrance doors slightly, but not conspicuously, visible from the driveways. The rest room and toilet room floors are of tile, as are the walls to a height of six feet, 10 inches. The tile walls are trimmed in pale blue. The rest rooms have a built-in seat and a mirror across the width of the room above the wash bowl. The equipment is thoroughly modern throughout.

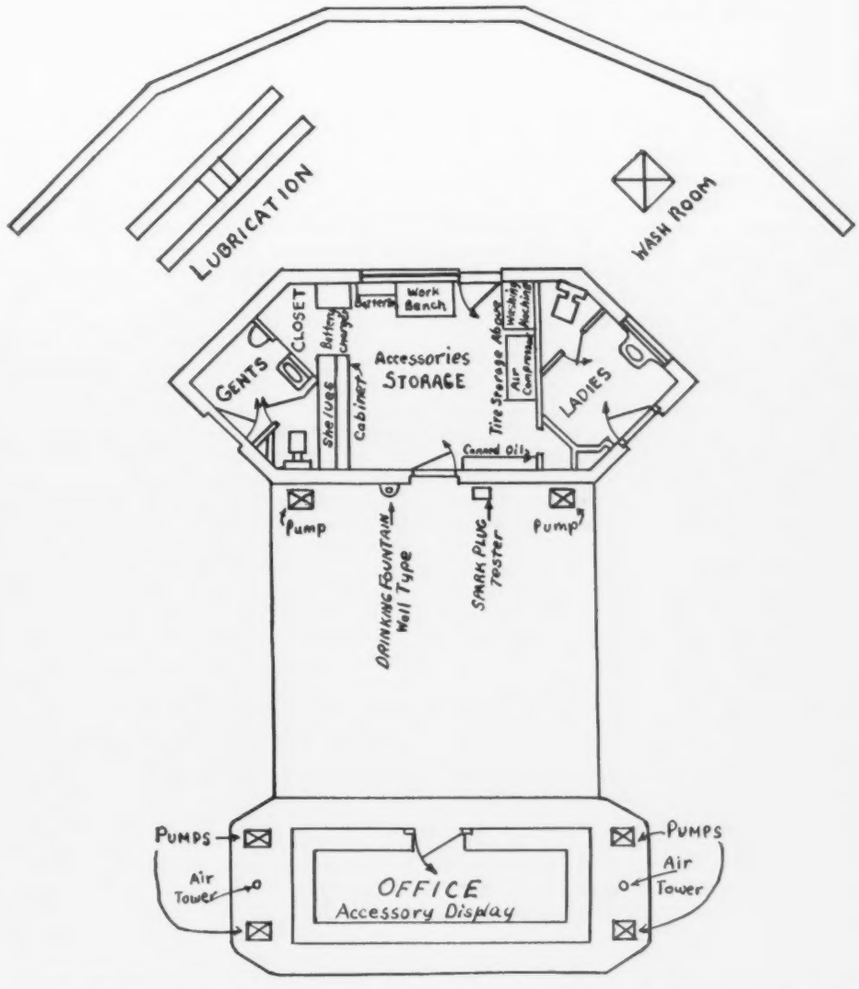
As to general construction, the foundation is reinforced concrete. Building walls are of common brick, plastered on the inside, stuccoed on the exterior. The base and trim around doors of the main building and rear wall are of blue porcelain enamel tile. Sash are steel, doors wood. The facia around the roof line of the main building, canopy and office and product display room is of stainless steel, 22 inches wide. Ceilings throughout are of plaster to correspond with the outside walls. Roof throughout is built up composition, sloping toward the rear for drainage.

when it is desirable to screen the display room from the public gaze.

The pump island on which the sales and display room is located is a little over 18 feet distant from the main building, the canopy extending over this area forming the roof for the sales room. An electric computing pump is located at each corner of the island and there are two along the wall of the main building. There is an air stand at each end of the island between the gasoline pumps. Along the wall of the main building fronting the drive, in addition to the two gasoline pumps there, are a drinking fountain and a spark plug testing machine. The pump island is about 12 feet wide and about twice that in length; the office and display room is about 18 feet by nine in dimensions, with the door located on the side nearest the main building. The floor in the display room is of asphalt tile, the display shelves being covered with dark blue linoleum.

A realization of the difficulties for the station crew in keeping the lubrication and car washing department of a station in spic and span condition at all times, led to the placing of the servicing department in a flattened, U-shaped tunnel along the rear of the station building. The tunnel is continuous and complete washing and greasing is thus given under one roof. The enclosure is sufficiently ventilated, yet adequately protected to make servicing of cars comfortable at all seasons in the Gulf Coast climate. In the Houston station as built this servicing tunnel is about 60 feet in length and from 12 to 15 feet in width.

Realizing that the motoring and neighborhood public has learned to appreciate modern and sanitary rest



Floor plan of the new design of service station adopted by the Humble company, which embodies several new principles in providing convenience for customers and also attendants

Housekeeping is Index To Volume of Business

The rating of a station by an N.P.N. Service Station Inspection Form is a good index to the volume of business the station is doing in comparison with that at other stations in the same community. In several surveys by an N.P.N. reporter the stations with the lower ratings were the ones where complaint was heard about business being poor. At the stations rating the highest, the operators were generally found too busy waiting on trade, to help much on the inspection of their station, although their interest in the N.P.N. inspection was great.

Neglect of lighting continues to be found a prevalent cause of the low rating of many stations by the N.P.N. standards. Operators use too low wattage lamps to save a few cents on their light bill, or fail to give the lighting equipment the proper care to maintain its proper efficiency.

GASOLINE sales, at stations in one of Ohio's small manufacturing cities, were found to be best at stations which made the highest ratings by N.P.N.'s Service Station Inspection Forms, a recent survey by a staff writer showed.

This was checked by observing the number of cars entering the drives of stations and it was verified by bulk plant operators and truck drivers who deliver to all types of stations. While jobbers in this town, a short drive from Cleveland, were not willing to commit themselves on whether good business prompted good station housekeeping or well kept stations attracted more business, they were sure of one thing; that the one characteristic accompanied the other.

In seven filling stations in this small city visited by the NATIONAL PETROLEUM NEWS inspector-reporter, the station receiving the highest rating kept two men so busy that their attention to the writer was confined to the time in passing from one job to another. This did not indicate any lack of interest on the part of the station manager. On the contrary, the recognition of the station's superiority over the average station was appreciated.

A significant fact brought out on several inspection trips is that these busiest and highest rated stations do not handle the same brand of products; that more depends upon selling ability and station efficiency than on brand names of equally well known products. One of the characteristics of these leading stations, trite as it may sound, is the alert activity of the men in charge there. Though not covered in the N.P.N. inspection forms, the smartness of appearance and approach of attendants is one of the accompaniments of highest rated stations, it is recalled in reviewing the records of stations surveyed in several towns.

The value of display counters has been discredited to a certain extent by one company's stations and stress is laid upon the personal reminders of attendants. In other words attention is centered upon the motorists' obvious needs rather than attempting to strengthen doubtful wants. The results of this campaign over a long period are now being felt at a time when they are most needed. Customers who have been approached regarding tire and battery sales during the past several months are now coming in unsolicited to purchase these necessities.

A highly competitive situation has grown up within the past eight years in this city, during which 30 filling stations have been placed on an average of 600 feet apart on a three-mile stretch of the main street. While this density might be expected in a large city and could conceivably support owners and operators of the stations, the contrary appears to be true of these 30 stations. One factor in favor of this station density is that, in addition to the city's 9000 population, these stations cater to a large volume of transient motorists who travel through the city on two main highways which interconnect four large cities.

However, on this survey, station gallonage was found to vary from 50 gallons daily, in one instance, with no lubrication handled in the lubritorium, to far above the average at centrally located stations fully manned and equipped. The 50-gallon station is new, modern and located at a much traveled intersection. Lack of grading and landscaping, in spite of cement drives, gives the station an incomplete appearance which, no doubt, keeps many motorists away.

The 30 stations along the one main thoroughfare of this community range from curb pumps at garages and general stores to super service stations, and from tracksides with private blends to major company operated stations. Gasoline can be bought at a junk yard and a combination filling station and home.

SUBSTANDARDS in station equipment and maintenance were found to closely parallel those found in earlier checkups with NATIONAL PETROLEUM NEWS inspection forms. Clean toilet campaigns have had an influence that carries beyond this station accommodation and have produced a cleanliness complex which affects the major functions of the stations. Clean toilets and littered offices and lubritoriums are incongruous. The relatively high ratings, above 80 per cent as measured by the N.P.N. inspection forms, reflect the influence of the earlier campaigns of NATIONAL PETROLEUM NEWS and other agencies for improvement of service stations in this regard.

The few substandards which were found correspond with those previously reported. Deficient lighting was again found to be the commonest means of cutting expenses at stations. One lessee pointed out that a 1000-watt bulb costs three times as much as a 500-watt bulb and is twice as expensive to operate. When bulbs are frequently cracked by rain storms, it was found that considerable saving resulted from using the smaller bulbs. Because lighting appears to offer the least resistance to skimping when income is declining,

Fuel oil flood

Gasoline stocks are only 10.6 percent above a year ago and going down—why worry?

Fuel oil stocks are 40 percent above a year ago and going up—that's the real worry

Gasoline prices are stiffening—fuel oil prices are wilting—no wonder

What to do?

Make more gasoline and less fuel oil from every barrel of crude produced

Dubbscracking is the way to do that

Dubbscracking makes more and better gasoline and less and better fuel oil

And saves crude

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

it is the first to be applied to reducing expenses by some operators. At one station attendants admitted they had to use flashlights at night to see the gasoline in automobile tanks at the pump island. There were no island lights. The best attraction to the station at night, a glass enclosed tower with the company emblem and name, was kept dark because of the decline in gallonage.

ONE of the seven stations inspected was given a rating of 65 per cent. True to the rating, the station has been operating at a loss for three months and will soon be abandoned unless something is done to improve business. A family affair is this business and a more chaotic layout would be difficult to find outside a junk yard. Rutty drives, sunken and cracked concrete at the pump island and over the underground tanks, cracked and broken windows, flyspecked and uncleaned for more than a week, are enough to drive away even those who prefer that station's brand of motor fuel. Without going into the details of what was found inside the station, unclean toilets, unswept floors, inadequate and littered lubricating equipment, it is obvious that the station presented a striking contrast to a station rating 95 per cent by the N.P.N. inspection forms.

The 95 per cent rating was the other extreme in station maintenance found by N.P.N.'s inspector-reporter. Nearly every rule of good construction was observed in this station except that of locating underground tanks off the drive and this was practically impossible in the congested area in which the station is located. The absence of vent screens, one of the most commonly lacking pieces of equipment at all stations visited, was also noted at this station. The only serious deficiency was the lack of fire extinguishing equipment of any kind. The lighting was nearly up to specifications but interior lighting in this instance, was below the recommended level of intensity.

Even at stations where fire extinguishers were installed, it was common to find them in inaccessible places. While this reflects an excellent fire record it also indicates lack of experience with fire or non-acceptance of the experience of others. It is apparently forgotten by many that an extinguisher at the back of the lubritorium takes time to reach or may even be impossible to reach in the event of fire. The common extinguisher in filling stations is only a first aid and depends for its effectiveness upon instant availability.

There appears to be a tendency to neglect routine inspections at stations, such as checking the accuracy of pumps, blowing out moisture from the air hose and compressor, changing the oil in the compressor, and lubricating the pumps. Two instances of deliberate neglect of cleanliness were observed, attributed by the operators to failure of oil company lessors to provide needed supplies or to repair equipment in the station.

Both of these stations were among the most attractive and newest stations visited. One of these stations was enjoying increased business because of increased traffic but did not wish to be "inspected" because, so the operators said, they were attempting "to shame the lessors into providing needed improvements by neglecting the cleanliness of the station."

Although the inspection form was not filled out in this instance, dirty windows and the office desk piled high with old newspapers and magazines, spoke eloquently of the "shaming neglect". Because the station's attraction is difficult to conceal by neglect, it was pointed out by another operator in the same territory with envy and it would not be surprising to find another lessee, when the present lease runs out, who would make the best of the available equipment.

THE average rating of the seven stations for which the N.P.N. inspection forms were filled out on this survey was 84 per cent. Eliminating the lowest rating raises the average to 87. This average is lower than averages found on other inspection tours and is perhaps accounted for by the excess number of stations found in this community which make it impossible for the best station to do the volume of business it would handle under more nearly normal conditions and that operators, in general, are not of the type who will maintain the station's appearance and efficiency at the highest point.

Although the service station idea grew to maturity during the 1920's in many communities, it was not until about 1930 that this community had a fully equipped service station, gasoline trade being supplied by curb pumps mainly before that time, it was said. The extraordinary success of the first venture was responsible for the later mushroom-like growth of filling stations, it was said, and perhaps also for establishment of the ten local bulk plants which now supply the city's and county's needs.

Won Roadside Beautification Contest In Tulsa

Directly across the street from the Grimes Service Station at 1201 South Lewis Ave., Tulsa, is the materials yard of a construction company, with an unsightly array of machinery. Just south of the station is a railroad right-of-way. Back of the station is a middle class residential section.

Otho H. Grimes, owner of the station, decided he would make his place as attractive as possible, regardless of the surroundings. He planted shrubs, trees and hedge. He and his assistants spend their spare time keeping the place in order.

On July 8 the Tulsa Garden Club presented Grimes with a plaque signifying his station had won first prize in the roadside beautification contest conducted this spring by that organization.

The station attracted wide attention several years ago when Grimes painted on the side of his large above-ground storage tank, the slogan: Gasoline is Cheap, Only the Tax is High.

The contest in which the Grimes station won first place in Tulsa is a part of a nationwide plan of the national counsel of the Garden Club of America. Each state's organization, however, conducts the contests, with the city chapters actually sponsoring them in each community. At the present time, it is said, no national prizes are being offered.

N. P. N. says this is an advertisement but we say it's National Petroleum News

Sales through this modern station operated by the Belden Oil Company at Richmond, Illinois have shown tremendous increases since this company's recent change in source of supply

Reading Time—One Minute
Sales Increase—90 Per Cent

SOMETIMES the shortest stories have the most point to them. You have probably been bored with long-winded sales arguments as to why you should sell this or that brand of petroleum products. When you boil it all down there is really only one good reason for handling *any* kind of merchandise—and that is to make money.

We think you will find the following brief letter very much to the point. It tells why one jobber is happy with his Phillips 66 franchise:

Phillips Petroleum Company,
Bartlesville, Oklahoma.
Gentlemen:

Since handling Phillips 66 products I have enjoyed a wonderful increase in sales.

A year ago I changed from another major brand and since then I have realized an increase of 90 per cent in sales of Phillips 66 gasoline, motor oils, and other products.

The Phillips Petroleum Company offers the best set up that any jobber or dealer can obtain, and the dealer selling 66 gasoline, 66 Motor Oils, Phillips accessories, and Lee Tires can really cash in on the public acceptance.

Thank you for the fine co-operation you have given me during the past year.

Very truly yours,
Belden Oil Company
by—Harry Anderson

Mr. Anderson has had actual experience with the products he recommends. He jobs Phillips complete line in Richmond, Illinois, and vicinity, and his dealers make money because the orange and black shield trademark spells "QUALITY" to motorists.

There are quality buyers in your territory. They are folks who would welcome the chance to buy Phillips 66 products from you and your dealers.

To check on the Phillips franchise, or to get information about Phillips jobbing arrangements, write, wire, or phone

PHILLIPS PETROLEUM CO.
Bartlesville, Oklahoma

Chicago Minneapolis St. Louis
Indianapolis Des Moines Omaha
Peoria Kansas City Wichita
Tulsa Amarillo

Credit, Delivery Problems With Heating Oils

Credit and delivery problems with range and heating oil are somewhat different than with gasoline and they bring up new problems for the oil company.

One reader of National Petroleum News recently asked its Editorial Department for oil companies' practice with range and heating oil deliveries, for example, where the driver made a delivery on his own authority; how credit is arrived at on initial deliveries; how C.O.D. sales and collections are handled by drivers; satisfactory methods of payment for drivers and so on.

The accompanying article is an attempt to answer some of these questions, based on the experience of heating oil distributors in Washington. A following article will discuss the same questions as they apply to range oil deliveries particularly in the middle west.

THE problem of credit in the domestic fuel oil business appears to be one to which there is no "universal" answer.

In a survey conducted by NATIONAL PETROLEUM NEWS in Washington, where the annual consumption of fuel oil has been growing rapidly as oil burner installations in old as well as new homes have increased, it was found that some dealers are developing new methods, others are adapting to fuel oil methods carried over from coal, or other businesses, and still others seem to be floundering without any set regulations. As many new installations in Washington, as is the case in other cities also, are made by firms selling only the burner, and not the fuel, one of the first problems seems to be that of the initial delivery.

How is it handled? That question has been asked of many fuel oil distributors here and the answers are varied.

Most dealers insist that, unless time is given to check credit rating of the prospective purchaser, the first delivery should be c.o.d.

Others say "we try to 'sell' him on the idea of paying for the first delivery," but add that if they are unsuccessful in this (the order probably comes in over the phone), they try and get enough information out of the prospective buyer to satisfy them that one delivery at least will be a good risk.

Even in this latter case, the account is turned over to a retail credit agency for further information before the second delivery is made.

If the prospective user is known to the dealer, or "vouched for" by someone in the organization, he is given credit on the first delivery, but the routine check with the credit agency is made before the account is opened.

If the fuel oil dealer has made the installation of the burner, of course, he has already checked on the customer's credit rating, and the necessity for further check is eliminated.

The general answer to the question as to whether the "first delivery" is c.o.d. or on an open account, among Washington dealers seems to be "c.o.d.", unless there are some extenuating circumstances.

How far shall we go in letting our truck drivers "pick up" new business on their rounds?

Fuel oil dealers have asked themselves this question, when Joe Jones, a driver, comes in to the plant office and announces he has dropped off 65 gallons he had left over in his truck after making his last scheduled delivery at a home the company has never served before. —"No, he didn't get the money, but it was a fairly nice looking house, and he was sure it was O.K.," states Jones.

The answer, as far as most of Washington's distributors are concerned, is that Joe should know enough before he went out not to drop off even a dime's worth of fuel oil that he hadn't been told to leave by his dispatcher—or at least not until after he had called the plant.

The prospective customer who hails Joe on the street and asks him to let him have 50 gallons on account is rare, it was said, but some of 'em do it.

Joe's instructions, if he's working out of a Washington bulk plant, probably are to tell the customer that he's got every gallon of his present load scheduled (which he usually has), but

25,785 Burners Installed in Washington

WASHINGTON—An idea of the rapid growth of fuel oil distribution in Washington may be gained from the District of Columbia Fire Marshal's figures on domestic burner installations during the past several years.

The figures given here are for the District of Columbia proper, and do not include the suburban areas in Maryland and Virginia, in which perhaps as many more installations have been made, although statistics are not readily available.

Installations of burners during the fiscal years (July 1 to June 30) from 1932 to date follow:

1932	1091	1936	3899
1933	1296	1937	4463
1934	1685	1938	3415
1935	2464		

Since there were some 7500 burners already installed in 1932, when the above series of figures begins, District authorities fix the number of oil burners in D. C. as of July 1 this year at 25,785.

Monthly installations during the past 12 months have run from 136, in April, to 660, last October, which was a new monthly record for installations.

NATION-WIDE ACCEPTANCE!

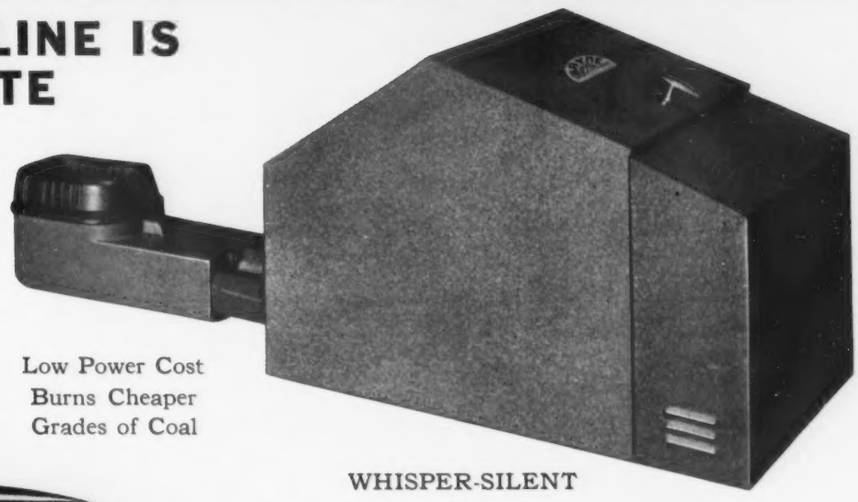
HERE'S JUST WHAT YOU'VE BEEN LOOKING FOR

THE WAYNE LINE IS COMPLETE

WITH EVERY TYPE OF AUTOMATIC HEATING

●

WAYNE'S REPUTATION IS YOUR GUARANTEE



Low Power Cost Burns Cheaper Grades of Coal

WHISPER-SILENT

THE WAYNE OIL BURNING HEATER
Circulating and Radiating

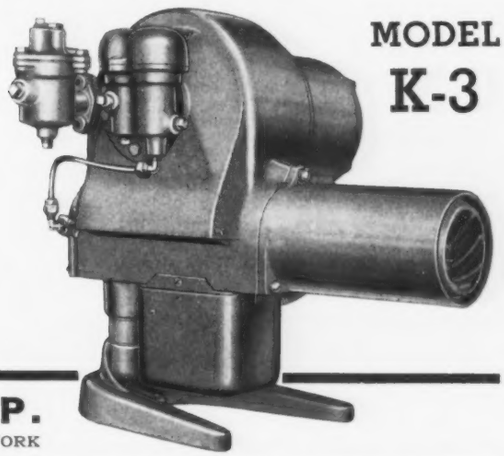
An efficient oil burning heater—beautiful in design with a handsome two-tone ripple finish. Rigid steel frame construction throughout. Side radiating doors—14" x 24" opening on each side. Fifty per cent greater free area opening at top. Made in three sizes. Ten inch size has 1408 square inches of effective heating surface. LOW PRICE—LIBERAL DISCOUNTS.

THE WAYNE STOKER
All Sizes—25 lbs. to 1200 lbs. Capacity

A stoker engineered by Wayne—for extra long life and finer performance. Many exclusive features of design,—Wayne precision manufacture.

An OIL BURNER Built for the Mass Market

The new Wayne Model K-3 tops all previous records for big value in automatic heating. It is completely Wayne engineered and Wayne built—the product of many years of experience. Among other exclusive Wayne features it incorporates the new Wayne Combination Strainer and adjustable Needle Valve which makes it possible to eliminate tank hum under all conditions. Compare its outstanding performance with any other burner and you'll choose Wayne every time.



MODEL K-3

DISTRIBUTORS • WRITE OR WIRE AT ONCE FOR TERRITORY

THE WAYNE OIL BURNER CORP.

FORT WAYNE, INDIANA • EASTERN OFFICE: BROOKLYN, NEW YORK

EXCLUSIVE MANUFACTURERS OF AUTOMATIC HEATING EQUIPMENT FOR NEARLY A QUARTER OF A CENTURY

that he'll be glad to call the office and tell them about Mr. Robinson, who hailed him.

If, by chance, Joe is returning from a trip and *does* have 50 gallons in his tank, he won't open the valve until he's called the office to find out if Robinson's credit is all right. He knows he's charged with every gallon he takes out, and, if Robinson doesn't put the cash on the barrelhead, it's he—Joe—who will have to.

Even if Robinson is an old customer, who used to buy from Joe's company last year, or the year before, on an open account, there is no deviation from the rule that Joe must have orders from the office before he sends a drop of oil down anybody's fill-pipe.

Whenever Joe leaves the bulk plant with a load of No. 1 or 2, or any other grade of oil, he has with him the customer-cards for all the customers he's going to serve with that load. On these cards is marked the gallonage to be delivered and the method of payment—whether he is to get the cash or whether it's an open account.

These cards constitute the companies' "credit list" in most cases, so the only job for the driver is to watch them. The office takes care of the rest.

Since drivers may be routed in one section of the city today and another tomorrow, no list of customers whose credit is good, not so good, bad, indifferent, or whatever other designations are used, is given to Joe and his coworkers. The dispatching cards suffice.

Open account customers are required to keep "current" with their payments by all distributors. But "current" has a variety of meanings in Washington. One big distributor says that most anybody can get before paying is two months supply, and possibly one delivery the third month, before his credit is cut off.

Another says that, if the cash isn't in the office by the 15th of the month after bills are sent out, not another drop of oil is delivered until the account is squared—or at least a payment made, along with a satisfactory explanation.

The two-months-and-one-delivery distributor explains his operations thus: During November a customer gets two deliveries of oil, and is billed for them on Dec. 1. He doesn't remit during December, but it may be an unusual circumstance and he is let go with a second notice. During December (it may be a cold month) he has to have two more deliveries, so on Jan. 1 he is billed again, this time for November and December deliveries. If he hasn't paid up by Jan. 10 (and he may have been given another delivery in the meanwhile) his card automatically goes in the c.o.d. file, and an effort is made to collect for the five deliveries.

Others say that if the 10th of the month following billing goes by without a remittance, the customer is notified again, and if another 10 days goes by, he is told there will be no more deliveries until a settlement is made. This, too, automatically puts him on the c.o.d. list for all future deliveries, or at least until his credit is restored.

Of course, again the individual case is cited by all dealers and distributors. There may be the case of the man whose credit is known to be good, but who is out of a job, or of the family known to the management, who will pay up when they are in better shape—but again, these are the exceptions which make the general rules the more important.

C.O.D. Sales and Collections

Collections by truck drivers—both of c.o.d. sales and of open-account payments—constitute another problem whose answer is arrived at differently by various distributors.

In plants of most of the larger, more efficiently operated distributors, the truck driver is permitted to make collections on open accounts if the customer wants to pay him, and in most of these plants, the driver "turns in" at the end of every trip, getting a receipt for the money handed over.

In other plants, and even in some of the plants where trip-turn-ins are the rule, some truck drivers wait until the end of the day to turn in, getting a receipt for the entire day's collections at one time. The general rule, though, seems to be turn-ins at the end of each trip.

Receipts given the drivers vary. Some distributors who pride themselves on their efficiency of operation, insist

To Tide Water Oil Executives:

(MRS.) LILY A. LONG
Bethlehem Penna.

CONGRATULATIONS on your public spirited effort to reduce the toll of traffic accidents.

For years I have been an automobile passenger rather than at the wheel. I have tried not to be a "back-seat driver," but I have had my thoughts.

These thoughts have been entered in your contest in the proper way as directed, and Mr. E. L. Shea has acknowledged my entry.

Since probably hundreds of thousands of contestants have entered their views which may be judged more worthy than mine, I would like to put my thoughts at your disposal, without obligation, and without regard to whatever their fate may be in the contest:—

Use caution on curves.
Stay in line on hills.
Enter intersections watchfully.

Take time to be prudent.
Yield right-of-way to children.
Do unto others—as Scripture says.
Omit liquor at the wheel.
Lubricate your car for safety.

Respectfully,

(Mrs.) Lily A. Long,
Kenridge Farms, R. D. 2,
Bethlehem, Penna.

that the driver be given a receipt listing the exact amount received from each customer, by name, and whether it was collected on a c.o.d. delivery or on account. This method, while it may entail more "bookkeeping" at the outset, is upheld by the companies using it on the theory that it will eliminate unnecessary scratching through books and cards if there should be a slip-up in a driver's account at a subsequent time.

Suppose our friend driver Joe Jones has collected from four c.o.d. customers on one trip, and also collected one monthly account of $14.22 or so.

He comes into the plant after his trip, and gets a receipt for $27.96, which is divided into five parts, listing the $14.22 he got on the open account collection and the four c.o.d. sales, and the names of the various customers.

A couple of weeks later, some bookkeeper having slipped up, Mr. A is charged with the $14.22 again on his monthly account. He gets the bill, calls up, and announces he paid Joe when he was around dropping that last delivery. Duplicates of Joe's receipt stubs are looked over and, sure enough, there is A's $14.22—Joe collected it, gave customer A a receipt, turned it in to the company, and himself got a receipt, the duplicate, or stub, of which is still in the office.

On the other hand, some of the companies contend this is too much bookkeeping and, when their Joe turns in, he gets a receipt for $27.96 and no specifications noted. Slip-ups are so rare, say these companies, that the extra time of writing out the explicit receipt is almost invariably wasted. If necessary, they can check on Joe's routing slips for the day in question, see whose homes he visited and check against them on the credit cards.

In either event, however, the company has a pretty effective check on where the money comes from—and so does Joe.

C.O.D. deliveries do not constitute a very large part of any of the larger Washington distributors' business—even in the districts of the most modest homes—they say. One dealer whose trucks go to many districts where the average monthly income is below $100, says that his c.o.d. deliveries are not more than 30 per cent of his total domestic fuel oil business, and others estimate considerably less. And the payment to a truck driver of an open account item is even rarer, it was pointed out, so that the necessity for fuel oil drivers being prepared to handle any volume of currency is not large.

Drivers' Pay

The drivers are paid on various bases—some hourly, some daily, some weekly. In Washington hourly wages run around 55 to 60 cents, depending upon the company and the service of the driver. Several distributors use these two figures—55 cents for new drivers, 60 cents for those who have been with the company for some time.

Their hours will run around 60 hours a week, in winter time—giving them a weekly wage of from $33 to $36.

Hourly wages, it is found, are more often paid by companies which, having no other work for drivers in the summer time, are forced to lay them off during the non-heating season. In most cases, drivers get their jobs back next fall, if they haven't found something more permanent.

Companies here which pay a daily or weekly wage pay their drivers an average of $5 for a 10-hour day. New drivers are started out at $3.50, or $3.75, and, in the case of some of these companies, are more or less selected men, who may develop into something more than truck drivers after some service with the company.

Often these distributors have work which will keep many of their men—on a basis of seniority—busy during the non-heating months. Installations of new oil burners, or of air-conditioning plants, are among these.

One distributor described a plan whereby, even if he has to "lay off" some of his drivers in the spring, they may still have a little nest egg as a result of their winter's work, to tide them over until they connect with a new job.

He said that all wages were based on a 10-hour day but that, during the peak heating season, the days usually run longer. In this case the "overtime" is credited to the driver, at the same rate as his pay schedule and, when and

FLEET-WING

GIVES YOU YOUR

Own Brand

"Go Fleet-Wing" as hundreds of other jobbers have done and you have your own brand—a brand that is *yours* in your own territory—without competition from your supplier.

Then, too, you have an assured source of supply that provides a *complete* line, not only of gasoline and motor oils, but also of lubricants and other specialties with which to build added volume at no additional cost.

Phone or wire us to find out if your territory is open for a Fleet-Wing contract.

The Fleet-Wing Plan Provides

- An independent jobber brand
- A complete line of Quality products
- An assured source of supply
- Continuous sales and merchandising cooperation
- Building and reconstruction service
- A program that builds profitable volume

FLEET-WING CORPORATION, CLEVELAND, OHIO

Fleet-Wing Golden Gasoline—Fleet-Wing Ethyl—Fleet-Wing Certified Motor Oil—Fleet-Wing 100% Pennsylvania Motor Oil—Fleet-Wing Specialized Automotive Lubricants—Fleet-Wing Fuel Oil—Fleet-Wing Farm and Tractor Oils and Greases—Fleet-Wing Specialties.

if he has to be let go in the summer, his pay goes on until this "overtime" pay is exhausted. Year-round employes often find this accumulated overtime money a means by which they can get a vacation, too.

Often these year-round employes, who are drivers in the winter and something else in the summer, get to the point where they make $6 or more a day, and many of them, some of the companies say, have worked themselves off the driver's seat into the dispatching office or to an even better job because they could do something besides pilot a tank truck, set a meter and twist a few valves.

The question of what to do if a customer is not at home when the driver comes to fill up his tank is one which has puzzled fuel oil distributors—and their drivers—ever since the burning of oil in homes became general. The method by which it is handled by various distributors is varied.

Some have instructed their drivers to make the delivery and leave the ticket in the door, unless instructed otherwise. This applies to both "order" and "degree day" customers, but the instructions go further than that—unless the driver can get to the tank to see the gauge, or unless there is a ventalarm to prevent his running the tank over, the instructions are off.

Some customers, of course, leave instructions that there shall be no delivery unless they are at home—degree-day, ventalarm or come what will. It's just a trip lost if Joe goes to these houses, knowing full well that his boss will be blamed if the customer runs out of oil at 3 a.m. with the thermometer at 10 above zero. Joe has his orders.

Like all the other practices which have grown up in connection with fuel oil delivery, this, too, depends on the individual customer—and his instructions are noted on his "delivery card" by most of the larger distributors. Drivers for the smaller dealers often know their customers' desires as regards deliveries.

The general rule on orders and degree-day deliveries is "go ahead and deliver, if you can get in or if there is a ventalarm to tell when the tank is full—unless, of course, the customer has instructed otherwise."

To overcome the necessity of getting into the house in such cases as the above, many dealers here are installing ventalarms on their customers' tanks free of charge to the customer, hoping thereby to save enough truck time to eventually pay for the installation—estimated to cost about $2.50 per alarm.

James H. Botkin, recently appointed comptroller of the Pure Oil Co., Chicago, succeeding the late Arthur M. Brereton. He was formerly assistant comptroller in charge of accounting for producing, pipeline, and crude oil purchasing departments, and has been with Pure for 18 years

CORRECTION

The photograph of Thomas H. Murphy, of Greeley, Nebr., was erroneously published on the frontispiece of the July 13th issue of NATIONAL PETROLEUM NEWS as president of the Nebraska Petroleum Marketers, Inc.; when as a matter of fact his office had expired and he had been succeeded by J. W. Trenchard of Cambridge, who is now president of the Nebraska Petroleum Marketers, Inc.

Standards for Profits—Plant Inspections

An easy, yet thorough means to determine the efficiency and profit ratings of your Service Stations, Trucks and Bulk Plants. Compare them with your competition. Reduce your operating costs. Increase your PROFITS.

NOW IN BOOKLET FORM—CLIP AND MAIL TODAY

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Send me ..... copies of N.P.N. STANDARDS FOR PROFITS BOOKLET, for which I enclose check or stamps for .....

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25 cents each for single copies
5% discount on lots of 50 to 100
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Send me ..... copies of N.P.N. SERVICE STATION INSPECTION BOOKLET for which I enclose check or stamps for .....

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Single copies .....10 cents
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500 to 1000 copies..8 cents each
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5000 to 10,000 copies..6 cents each
10,000 and over .....5 cents each

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580 Penton Bldg.
Cleveland, Ohio

Send me ..... copies of N.P.N. TRUCK and BULK PLANT INSPECTION BOOKLET for which I enclose check or stamps for .....

NAME .....

ADDRESS .....

CITY .....

PRICE

Single copies .....10 cents each
100 to 500 copies 9 cents each
500 to 1000 copies 8 cents each
1000 to 5000 copies 7 cents each
5000 to 10,000 copies 6 cents each
10,000 and over copies 5 cents each

At Ned's new service center, a car rides along on this continuous conveyor with its own weight completely lifted off the shackles by a hydraulic jack which moves along with the conveyor. The conveyor is of the endless belt type and is power driven. (Photo by Austin Co.)

Assembly Line Method For Lubrication Jobs

THE speed technique of the automobile production assembly line is put to work in two service centers of Ned's Auto Supply Co., Detroit, where the car rides a lubrication conveyor to rapidly complete the servicing job.

At the second lubrication conveyor installation, just completed at the new Ned's outlet, from five to seven men are on the job as the cars travel the continuous conveyor above a spacious 53-foot pit, to turn out a lubrication job in ten minutes.

Recessed spotlights and hose carrying special lubricants for all purposes have been installed in the pit. If an oil change is necessary, the old oil is drawn out of the crankcase under a powerful vacuum, taking with it the sludge and other foreign matter, leaving the crankcase vacuum-cleaned.

Old grease is removed from the transmission and differential by a similar suction method, with provision for preheating during cold weather. Gear lubricants are metered into the cases under pressure direct from sealed drums.

Before the ten-minute ride is up, tires have been checked and inflated to the desired pressures, batteries tested and filled to the proper level, floor mats brushed or vacuum cleaned; all glass polished, and door locks and hinges treated with a dry oil.

This newest unit of Ned's is constructed of an exterior of limestone buff brick with stainless steel trim. Two tiers of continuous display windows, separated by a broad, luminous lettered band of structural glass, describe a sweeping curve across the entire facade of the store section. The service building, almost completely surrounded by continuous horizontal runs of sash, is equipped with special lighting fixtures tilted for direct illumination of vehicles being serviced, as well

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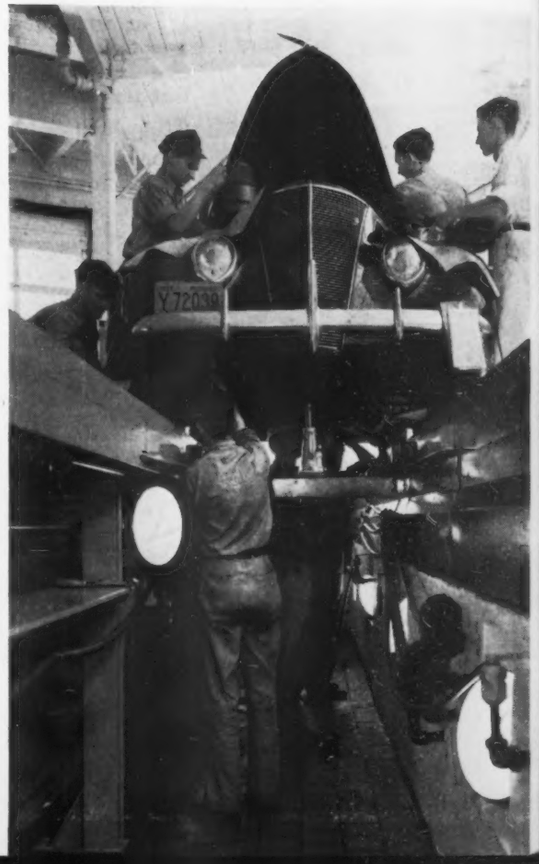


Spotlights are installed in the spacious 53-foot pit below the conveyorized automobile lubrication line, and provide direct lighting for the undercarriage of the cars being serviced. Metered lubrication under pressure is provided for chassis, transmission and differential. (Photo by Austin Co.)

The fifth and newest service center and store of Ned's Auto Supply Co., Detroit, recently opened with a conveyorized lubrication service which permits a complete service job to be done in 10 minutes. (Photo by Austin Co.)

as sub-floor lighting in the pit and on two brake testing machines.

Inside the spacious store room, where all types of automotive accessories, maintenance supplies, sporting goods, and household equipment are on sale, rich paneling, terrazo flooring and acoustical ceilings have been installed.

Museum-type displays, flush with the walls, facilitate inspection of merchandise, with a minimum of handling and service. A central cashier's desk permits simultaneous transactions with as many as 12 people.

Stocks of merchandise are stored behind fixtures and paneling throughout the store, and are supplemented by extensive stocks on the second floor, where a large area has been provided for the purpose.

In this newest Ned's unit, the most modern brake testing and relining equipment has been installed. Factory-trained men operate these machines and every motorist has the opportunity to drive in for a free brake test.

On the service drive in front of the store, seven of the latest type electric computing pumps have been erected. In the service room, the newest improvements in battery testing and tire mounting and repair equipment have been installed.

Many new innovations and conveniences for displaying and selling automobile accessories, electric home appliances, sporting goods and supplies have also been installed in the store. On cork-faced wall panel doors, which are indirectly illuminated, are mounted the automobile accessories, where the motorist may make his own selection and comparison.

Refrigerators, radios, and other electrical appliances are set up and connected, so that the prospective purchaser may see them operate as they would in the home.

Camping equipment and sporting goods—tennis, golf, fishing and baseball—as well as what the company claims to be one of the largest selections of bicycles in Detroit, complete the variety of merchandise offered by these neighborhood motorists' department stores.

The parking problem has been eliminated at Ned's also. The motorist drives onto the concourse or into the spacious service area, where an attendant will park his car, or perform any necessary service while the owner shops at the store.

When in the market for high quality . . .

. . . Pennsylvania Bright Stocks and Neutrals, we ask that you direct your inquiries to BERRY'S.

We manufacture a natural zero and ten pour test light bright stock and neutral oil without the use of ingredients of any kind. This assures the buyer of pure, unadulterated lubrication. Blended oils with a natural zero or ten pour are also available at this time.

When lining up a source of supply for your Fall and Winter Pennsylvania lubricants, we hope you will direct your inquiries to any of our various offices for either prompt or contract shipment over the winter months.

JAMES B. BERRY SONS' CO., INC. OIL CITY, PA.

Branch Offices: New York City; Chicago, Ill.; Boston, Mass.; Philadelphia, Pa.; Houston, Texas; London, England; Hamburg, Germany; The Hague, Holland.

Refineries: Oil City, Pa.; Emlenton, Pa.; Farmer's Valley, Pa.; St. Mary's, W. Va.
Ocean Terminals: Baltimore, Md.; Tiverton, R. I.; Dorchester, Mass.; Carteret, N. J.; Edgewater, N. J.; Glastonbury, Conn.; Philadelphia, Pa.

Standard Oil Company (Indiana) Denies Charge Of Fighting "Alky-Gas"

CHICAGO—Standard Oil Co. of Indiana has issued a 12-page statement denying charges made by Paul Beardsley of Sioux City, Ia., at the meeting April 26 of the Farm Chemurgic Council in Omaha, that the company had used economic pressure against promotion efforts for alcohol-gasoline blends.

"We have seriously considered bringing action for libel against Mr. Beardsley," said the Indiana Standard's statement, which was mailed to all persons participating in the Chemurgic council meeting.* But it was decided to issue the statement instead, it was explained.

Explaining its attitude toward "alky-gas," the Indiana Standard pointed out that it "regularly contacts about 2,000,000 farmers in the Middle West" and that its business fluctuates with changes in the farmer's economic welfare.

"If the use of power alcohol were a sound way of conferring benefits on the farmer, Standard of Indiana would also stand to benefit by encouraging such use," the statement said.

Taking up Beardsley's statement that oil companies had maintained a lobby, in several mid-western states where bills for compulsory use of "alky-gas" were considered, of "more men than there were members of the legislature" and had spent $100,000, the Indiana company said that only about a dozen oil company representatives were present and that their expenses were less than a twentieth of what Beardsley had said.

The company's statement pointed out that included in this group were technologists who testified at the hearings, adding: "There was not the slightest attempt to bring undue influence."

Much of the statement was devoted to replying to Beardsley's charge that the Indiana company had threatened to close—and did—its Sioux City division office, if a power alcohol plant was established there. There were no such threats, nor was the removal of the office in any way influenced by activities regarding alcohol blends, the statement said, adding that company files would show that discontinuance of the Sioux City office had long been considered.

Regarding the sponsorship of alcohol-gasoline blends in England by Cleveland Petroleum Products Co., which Beardsley said was "owned lock, stock and barrel by the Standard Oil Co.," the Indiana company statement said "the evidence is inescapable that Beardsley sought deliberately to mislead his audience" into believing that it was the Standard Oil Co. of Indiana which was involved, when actually it was the Standard of New Jersey. In addition, the statement added, the New Jersey company has stated that it only indirectly owns stock—but doesn't control—the English company and had not endorsed its "alky-gas" advertisements. It was also pointed out that the English "alky-gas" blend contained benzol, which is plentiful in that country but scarce here. Even in England, the statement added, this "alky-gas" blend can compete with regular motor fuel's price of 31.8 cents because the blend enjoys tax-exemptions and other government subsidies amounting to 27.8 cents.

The statement denied that the Indiana company or any of the Standard Oil companies owned any significant "alky-gas" patents.

Copies of the Indiana company's statement, it was said, are being placed in the hands of the company's field representatives as the expression of the company's attitude on alcohol-gasoline motor fuel.

"They (Indiana's field men) have been instructed to regard the alcohol-gasoline movement as they would a social or political movement—as something outside the sphere of their interests, in which they are to take no part and with which they are not to interfere," the statement said.

*See N.P.N. April 27 and May 4, 1938.

Dealers May Sell "Alky-Gas" If They Choose, Says Standard

In its detailed statement answering the charges of Beardsley, the Standard Oil Co. of Indiana sets forth its attitude toward the alcohol gasoline movement in general. Depending to a greater extent than almost any other concern in its territory on farmer patronage, it would stand to benefit greatly by encouraging the use of power alcohol if it felt it economically sound, the statement sets forth, presenting also many economic arguments against alcohol-gasoline motor fuel as it is at present being promoted in this country.

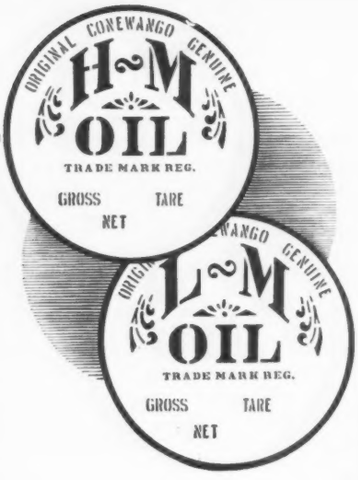
The company also says that, where its dealers desire to sell "alky-gas" at their stations, they have the right to do so. It says it will give them all available information on the subject but will allow them to make their own free choice as to whether or not to sell it through their pumps. This part of the company's statement in full reads:

"Standard Oil Co. (Indiana) purchases more crude oil than it produces. It could just as well buy farm products and manufacture alcohol as buy crude oil and manufacture gasoline, and would be doing so if alcohol could compete with gasoline on a business basis.

"For many years Standard of Indiana has been hauling petroleum products into farmyards. It regularly contacts about 2,000,000 farmers in the middle west. Few, if any business concerns are as closely in contact with the farm. A large share of its business is done with farmers. That business fluctuates with the changes in economic welfare of farmers. If use of power alcohol were a sound way of conferring benefits on the farmer, Standard of Indiana would also stand to benefit by encouraging such use.

"This company's technologists have been aware of the technical possibility of alcohol for motor fuel use for many years. They have watched successive waves of lay opinion on the subject rise and fall. Always, the idea has shattered on the question of cost. Until alcohol can be produced as cheaply as gasoline, or until the cost of gasoline becomes much higher than it is today, there is no technical or economic advantage in using alcohol as a motor fuel sufficient to justify the cost to consumer or dealer.

"Mr. W. W. Buffum stated at the Omaha meeting of the Chemurgic Council that the Chemical Foundation's Atchison plant is now manufacturing power alcohol at 22.3 cents a gallon. This figure is theoretical in the sense that it is figured on the basis of recent and brief operations. Certainly it is not the actual average cost of the alcohol manufactured by the plant so far, giving due consideration to overhead costs. But the figure can be ac-



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THE CONEWANGO REFINING CO.

Warren, Pa.

cepted, and the fact still remains that it is four times the five to six cents for which regular grade gasoline can be purchased at refineries in competing territory.

"With this marked difference in costs, sale of alcohol blends in competition with gasoline would only be possible on a straight business basis if advantages of the blended fuels could offset this cost differential. As to this, there is no doubt that alcohol-gasoline blends will run automotive engines reasonably well, but it is the considered and unanimous belief of our engineers and chemists that blends *have no advantages which will offset additional cost.* This opinion is shared, although not always openly expressed by, we believe, all unbiased qualified experts in the automotive field. Substitution of blends for gasoline in any given car may, or may not, show a slight advantage in some particular respect.

"But any advantage is inevitably gained at the cost of some disadvantage, whether noticeable to the vehicle operator or not. With blends containing ten per cent or less of alcohol, these effects may be slight. However, even such blends will give the *average consumer* of motor fuels either slightly inferior performance or slightly less mileage than gasoline of similar antiknock quality. To be sure, blends of high antiknock rating may give better performance in engines requiring high octane fuel than would gasoline of unsuitably low antiknock rating; even so, cheaper means than alcohol are available for improving gasoline of low knock rating.

"The foregoing statements may seem surprising or even incredible to some who have made or witnessed tests in which a substantially increased mileage was apparently obtained on alcohol blends. Part of the reason for this lies in the extreme difficulty of making road tests under exactly the same conditions. Another possible cause is the fact that many automobile engines are adjusted very inefficiently, with the air supply insufficient for properly complete combustion of the fuel. Alcohol blends *require* less air for proper combustion. In such cases substituting an alcohol blend is equivalent to engine adjustment and may, therefore, give noticeably improved results. However, it is obvious that mechanical adjustment of the engine would be simpler and cheaper, and in a properly adjusted engine the statements of the previous paragraph will apply.

"Alcohol blends are consequently not worth added costs. In the long run the consumer will not pay higher prices for them without compensating advantages unless he is compelled to do so. In the long run the jobber and the dealer will not absorb the additional cost as they are at present doing in various instances. This is a plain statement of fact; we do not consider it an 'attack' or 'opposition' of any sort.

"There remains then the argument that alcohol should be used as a permanent measure for farm relief; in other words, that somebody—the consumer or the supplier of motor fuels—should pay a higher cost (amounting under present conditions to about two cents a gallon for a blend containing only 10 per cent of alcohol) in order to subsidize some expansion of the market for farm produce. Without arguing the question of whether the consumers or suppliers of motor fuel should be expected to subsidize agriculture in addition to paying all the other taxes imposed upon them, it may be stated very emphatically that the power alcohol project is a most expensive method for achieving any given farm benefits. It is expensive because by far the greater amount paid for alcohol does not go to the farmer but to the processors of farm products and because the farmer must himself pay for a large part of his gain through increased motor fuel cost. It is discriminatory because at best only farmers in the vicinity of distilleries could benefit materially from it.

"The power alcohol idea admittedly has strong superficial appeal. Careful study is necessary to see its deficiencies as a farm benefits' measure. In consequence it frequently receives strong support in rural communities where it is promoted. This support is often of a rather emotional nature which causes hostility toward anyone connected with the motor fuel business who fails to agree.

"It is obvious that if there were any certainty that farm buying power could be increased at reasonable cost by use of power alcohol, the Standard Oil Co. (Indiana) would be as likely to benefit as any enjoying farm trade. It must be obvious also that only because of an honest and positive disagreement with the thinking of the proponents of power alcohol has this company refrained from supporting the idea. We do not believe at this time that the plan will work so as to benefit farmers enough to justify the cost.

"Nevertheless we have not wanted to be dogmatic or to interfere in any way with the opinions of those who favor power alcohol. If they are right, alcohol-gasoline fuels will come into use without the aid of high-pressure promotion. If they are not right, that fact will also become apparent in due time. Time and economics will decide more certainly than debate.

"Meanwhile it is our view that if a customer wants a given product, regardless of merit or cost, he will find some way to obtain it. If we could honestly do so we would cater to farm customers and to others who believe in the power alcohol idea, at least by stocking and delivering power alcohol to any dealers and consumers wanting to try it out. We cannot honestly take such action because we do not believe the product or any obtainable benefits worth the extra cost.

"We no longer operate any stations retailing motor fuel to the consumer. Under the terms of our dealer lease contracts, any dealer has the full right to sell any motor fuel. His only obligation to us is to remove our dis-

tinctive globes and insignia from the pump. If any of our dealers wishes to try out the handling of alcohol-gasoline blends he has the right to do so. Some of our dealers have already tried it and others are likely to want to do so. We intend to give them the available information on the subject, in line with the position and attitude explained in this statement. But we will exert no pressure otherwise to prevent their experimenting with sales of the fuel in whatever manner they deem wise. In following such a policy of non-interference and non-obstruction it seems to us that we are practically bending over backward to avoid giving cause for the charge that we in any way prevent dealers from finding out about alcohol-gasoline for themselves."

Ohio Marketers Plan Trip To Steel Mill

COLUMBUS, O. — A trip to the modern steel mill of the Youngstown Sheet & Tube Co. is promised as a feature of the fall conference and golf tournament to be held by the Ohio Petroleum Marketers Assn. at Youngstown, Oct. 5 and 6. Plans now are to make this trip after the first day's morning session, with the steel company indicating an eagerness to serve luncheon to the visitors at its plant dining room, according to the "Ohio Petroleum Marketer" of July, association bulletin.

Preparations are being made to enter 100 golfers in the golf tournament taking place the second day at the Southern Hill Country Club. Winners will be awarded prizes during the luncheon, which, incidentally, will be a steak luncheon.

Committees to handle the conference have been appointed by E. V. Weber, president of the association. E. Clyde Woods, Vahey Marsh Woods Co., Youngstown, is chairman of the general committee. William G. Lyden, Lyden Oil Co., Youngstown, is vice-chairman.

Chairmen and vice-chairmen, respectively, of other committees are:

Attendance committee: Dennis G. Rice, Rice Oil Co., Johnstown; and Leo M. Scheiderer, Penn Oil Co., Marysville.

Reception: Earl Stroup, National Refining Co.; and L. H. Alexander, Eagleroc Oil Co., both of Youngstown.

Entertainment: John Mitchell, Commonwealth Oil Corp., and Roy Eaton, Eaton Oil Co., both Youngstown.

Golf tournament: Byron W. Leach, The Pennzoil Co., and Edward F. Lyden, Lyden Oil Co., both Youngstown.

Program: William G. Lyden, Lyden Oil Co., Youngstown; and Don F. McIntosh, J. C. & D. F. McIntosh, Canton.

Business sessions will be held the first day at the Ohio Hotel, with a dinner and entertainment following, according to Robert A. Warfel, executive secretary of the association, and editor of the bulletin.

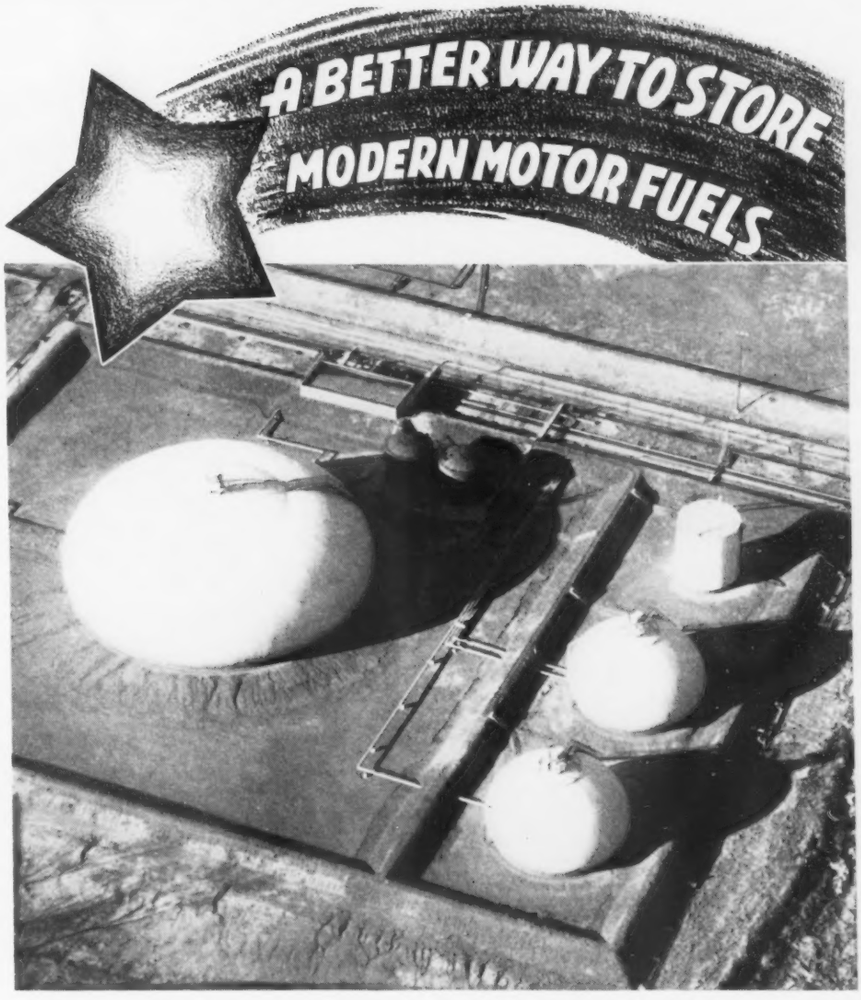

PHOTO: Fairchild Aerial Surveys, Inc.

Use Hortonsperoids!

THE above picture shows one 80,000-bbl. and two 10,000 bbl. Hortonspheroids at Rensselaer, N. Y. They are used by the American Oil Co. to hold high test motor gasoline at pressures up to 2½ lbs. per sq. in. The use of pressure storage for motor fuel serves two purposes: volumetric loss is prevented and lowering of octane rating is curbed—both through stopping evaporation loss while the gasoline is in standing storage.

The Hortonspheroid has proved itself to be a highly practical unit. Installations are being made in rapidly increasing numbers in all parts of the world. From a cost standpoint, the unique design results in a most favorable balance of economy with capacity. Hortonspheroids for handling motor fuels are available in standard sizes ranging from 10,000 to 100,000 barrels or more. Where smaller capacity or higher pressure is desired, as in handling natural gasoline, units are available in standard sizes from 2,500 to 30,000 bbl. For information address our nearest office.

Chicago Bridge & Iron Company

Cleveland ..... 2206 Rockefeller Bldg.
Chicago ..... 2125 Old Colony Bldg.
New York ..... 3345—165 Broadway Bldg.
Philadelphia ... 1614—1700 Walnut Street Bldg.
Boston ..... 1516 Consolidated Gas Bldg.
Detroit ..... 1513 Lafayette Bldg.
Dallas ..... 1439 Liberty Bank Bldg.
Birmingham ..... 1534 N. Fiftieth Street
Houston ..... 2919 Main Street
Tulsa ..... 1607 Hunt Bldg.
San Francisco ..... 1060 Rialto Bldg.
Los Angeles ..... 1422 Wm. Fox Bldg.

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Tank Car Gasoline Prices Are Lower In TPD July-September Contracts

N. P. N. News Bureau

WASHINGTON, July 25.—Lower prices generally prevailed in the tank car gasoline contracts awarded by the Treasury Procurement Division for the July-September quarter, according to an analysis of the TPD awards.

Since the July-September bids were opened in the early part of May, however, there have been several advances in tank car prices.

Two tank car marketers—Western Oil & Fuel Co., Minneapolis, and Tansel Petroleum Co., Tulsa—won nearly all of the Region 3 (Middle West) awards. For V-68 (regular) gasoline, Western Oil & Fuel's price was 4.69 cents f.o.b. Shreveport, La., and Tansel, 5.11 cents f.o.b. Wichita, Kans. Western Oil & Fuel also won a number of items in Region 2 (Southeast) with a price of 4.74 cents for V-68 f.o.b. Shreveport.

Prices tabulated below are the guaranteed maximum or top prices to be paid by the government. Should the seller's posted tank car price on date of shipment be lower than this maximum, the government agency will be billed at the posted price.

The government asked for bids on f.o.b. refinery basis (in which case the government pays the freight to destination) and on a destination basis where the price includes freight to delivery point. In the tabulations below, the column, labeled "f.o.b. point and shipping point," indicates the price basis for the particular item.

Tank Car Gasoline Awards for June-September Quarter

REGION ONE

V-68 Grade

3-Month Gallonage	Govt. Agency	F.O.B. Point and Shipping Point	Max. Price	Contractor
56,250	Aberdeen Proving Ground, Aberdeen, Md.	Destination, Shipped from Baltimore, Md.	6.634	Texaco
103,000	Quartermaster, Holabird Depot, Baltimore, Md.	Destination, Shipped from Baltimore, Md.	6.3106	Texaco
20,000	Quartermaster Corps, Edgewood Arsenal, Edgewood, Md.	Baltimore, Md., motor tank truck delivery	6.53	Shell Union
45,000	Quartermaster, Ft. Hoyle, Edgewood, Md.	Baltimore, Md., motor tank truck delivery	6.53	Shell Union
45,000	Quartermaster, Ft. George, G. Meade, Md.	Destination, shipped from Baltimore, Md.	6.469	Texaco
20,000	Natl. Guard Bureau, Natick, Mass.	Boston, Mass. motor tank truck delivery	6.93	Pennsylvania Oil Co.
53,900	Quartermaster, CCC Ayer, Mass.	Destination, shipped from Everett, Mass.	7.0	Colonial Beacon
20,000	Quartermaster, Boston, Mass.	Destination, shipped from Everett, Mass.	6.72	Colonial Beacon
24,000	Naval Air Station, Lakehurst, N. J.	Destination, shipped from Bayonne, N. J.	6.667	Texaco
35,000	Raritan Arsenal, Metuchen, N. J.	Destination, shipped from Bayonne, N. J.	6.403	Texaco
42,000	Quartermaster, CCC Processing Camp, Camp Dix, Wrightstown, N. J.	Sewaren, N. J., motor tank truck delivery	6.65	Shell Union
10,000	Quartermaster, Ft. Monmouth, Oceanport, N. J.	Bayonne, N. J.	6.04	Texaco
64,000	Quartermaster, Military Academy, West Point, N. Y.	Destination, shipped from Newburgh, N. Y.	6.367	Texaco
46,000	Quartermaster, Mitchel Field, Hempstead, N. Y.	Garden City, L. I., motor tank truck delivery	6.89	Texaco
14,000	Quartermaster, N. Y. Port of Embarkation, Brooklyn, N. Y.	Brooklyn, N. Y., motor tank truck delivery	6.72	Texaco
25,000	Quartermaster, Plattsburg Barracks, Plattsburg, N. Y.	Destination, shipped from Albany, N. Y.	7.486	Texaco
10,000	Quartermaster, Schenectady, South Schenectady, N. Y.	Albany, N. Y.	6.1	Texaco
7,000	Frankford Arsenal, Bridesburg, Philadelphia, Pa.	Destination, shipped from Marcus Hook, Pa.	6.348	Texaco
9,000	New Cumberland Gen'l Depot, New Cumberland, Pa.	Destination, shipped from Baltimore, Md.	6.898	Texaco
35,000	Quartermaster, Carlisle Barracks, Carlisle, Pa.	Destination, shipped from Baltimore, Md.	6.898	Texaco
60,000	Quartermaster Depot & School, Philadelphia, Pa.	Destination, shipped from Pt. Breeze, Pa.	6.25	American
18,778	Quartermaster, Ft. Ethan, Allen, Vt.	Destination, shipped from Burlington, Vt.	7.6793	Texaco

V-75 Grade

14,000	Aberdeen Proving Ground, Aberdeen, Md.	Destination, shipped from Baltimore, Md.	7.884	Texaco
8,000	Delaware Ordnance Depot, Pedricktown, N. J.	Destination, shipped from Petty Island, Pa.	8.24	Cities Service
40,000	Ordnance, Picatinny Arsenal, Picatinny, N. J.	Warners, N. J., motor tank truck delivery	7.85	Cities Service

REGION TWO

V-68 Grade

3-Month Gallonage	Govt. Agency	F.O.B. Point and Shipping Point	Max. Price	Contractor
87,500	Tennessee Valley Authority, Guntersville, Ala.	Baton Rouge, La.	5.02	Standard of Ky.
45,250	Tennessee Valley Authority, Wilson Dam, Ala.	Shreveport, La.	4.74	Western Oil & Fuel
47,314	Quartermaster, CCC, Ft. McClellan, Ala.	Shreveport, La.	4.74	Western Oil & Fuel
13,000	Quartermaster, Montgomery, Ala.	Baton Rouge, La.	5.02	Standard of Ky.
45,000	Engr. Corps, Supply & Repair Depot, Bridge Junction, Ark.	Pearson, Ark.	5.25	Lion Oil Refining Co., El Dorado, Ark.
6,928	Quartermaster, Ft. Barrancas, Fla.	Panama City, Fla.	5.5	Standard of Ky.
8,000	Bu. of Prisons, Atlanta, Ga.	Shreveport, La.	4.74	Western Oil & Fuel
21,750	Quartermaster, Ft. McPherson, Ga.	Shreveport, La.	4.74	Western Oil & Fuel
210,000	Quartermaster, Ft. Benning, Ga.	Shreveport, La.	4.74	Western Oil & Fuel
58,743	Quartermaster, Ft. Oglethorpe, Ga.	Shreveport, La.	4.74	Western Oil & Fuel
50,000	Quartermaster, CCC, Barksdale Field, Shreveport, La.	Shreveport, La.	4.74	Western Oil & Fuel
95,370	Quartermaster, Ft. Bragg, N. C.	Wilmington, N. C.	5.92	Texaco
6,000	Charleston Ordnance Depot, No. Charleston, S. C.	Charleston, S. C.	5.92	Texaco
69,170	Tennessee Valley Authority, Chattanooga, Tenn.	Shreveport, La.	4.74	Western Oil & Fuel
32,500	Tennessee Valley Authority, Hiwassee Dam, Turtletown, Tenn.	Shreveport, La.	4.74	Western Oil & Fuel
70,000	Marine Barracks, Quantico, Va.	Destination, shipped from Curtis Bay, Md.	7.07	American
25,000	Quartermaster, Ft. Belvoir, Va.	Destination, (shipping point not given)	6.95	Texaco
7,000	Quartermaster, Ft. Story, Va.	Destination, shipped from Sewalls Point, Va.	6.81	Standard of N. J.
27,500	Quartermaster, Langley Field, Va.	Destination, (shipping point not given)	7.214	Texaco

V-75 Grade

100,000	Marine Barracks, Quantico, Va.	Destination, (shipping point not given)	8.2	Texaco
7,000	Ordnance, Pig Point, Va.	Destination, (shipping point not given)	8.186	Texaco

REGION THREE

V-68 Grade

40,000	Naval Training Station, Great Lakes, Ill.	Lockport, Ill.	6.0	Texaco
30,000	Ordnance, Rock Island Arsenal, Rock Island, Ill.	Shreveport, La.	4.69	Western Oil & Fuel
30,000	Natl. Guard Bureau, Rockford, Ill.	Shreveport, La.	4.69	Western Oil & Fuel
10,000	Savanna Ordnance Depot, Savanna, Ill.	Shreveport, La.	4.69	Western Oil & Fuel
8,000	Chicago Quartermaster Depot, Chicago, Ill.	Lockport, Ill.	6.0	Texaco
45,000	Quartermaster, Rantoul, Ill.	Shreveport, La.	4.69	Western Oil & Fuel
96,526	Quartermaster, Fort Sheridan, Ill.	Shreveport, La.	4.69	Western Oil & Fuel
20,000	Quartermaster, Scott Field, Ill.	Wood River, Ill.	6.0	Standard

3-Month Gallonage	Govt. Agency	F.O.B. Point and Shipping Point	Max. Price	Contractor
87,500	Quartermaster, Fort Benjamin Harrison, Ind.	Shreveport, La.	4.69	Western Oil & Fuel
10,000	Quartermaster, Jeffersonville, Ind.	Shreveport, La.	4.69	Western Oil & Fuel
16,000	Engineer Office, near Mondamin, Iowa	Shreveport, La.	4.69	Western Oil & Fuel
17,300	Natl. Guard Bureau, Camp Dodge, Iowa	Wichita, Kans.	5.11	Tansel Petroleum Co., Minneapolis
39,500	Quartermaster, Fort Des Moines, Iowa	Wichita, Kans.	5.11	Tansel Petroleum Co.
36,000	National Guard Bureau, Fort Knox, Ky.	Destination, Shipped from Riverside Term., Louisville, Ky.	6.9	Standard of Ky.
8,000	Quartermaster, Fort Knox, Ky.	Destination, Shipped from Louisville, Ky.	6.9	Standard of Ky.
27,000	Natl. Guard Bureau, Grayling, Mich.	Shreveport, La.	4.69	Western Oil & Fuel
40,000	Quartermaster, Camp Custer, Mich.	Lockport, Ill.	6.0	Texaco
15,000	Quartermaster, Selfridge Field, Mich.	Shreveport, La.	4.69	Western Oil & Fuel
8,000	Natl. Guard Bureau, Camp Ripley, Little Falls, Minn.	Superior, Wis.	7.0	Standard
20,837	Quartermaster, Fort Snelling, Minn.	Shreveport, La.	4.69	Western Oil & Fuel
50,000	Engineer Office, St. Louis, Mo.	Shreveport, La.	4.69	Western Oil & Fuel
12,000	Engineer Office, Gasconade, Mo.	Shreveport, La.	4.69	Western Oil & Fuel
12,000	Engineer Office, Glasgow, Mo.	Shreveport, La.	4.69	Western Oil & Fuel
12,000	Engineer Office, Kansas City, Mo.	Sugar Creek, Mo.	5.5	Standard
12,000	Engineer Office, Napoleon, Mo.	Sugar Creek, Mo.	5.5	Standard
12,000	Engineer Office, St. Joseph, Mo.	Wichita, Kans.	5.11	Tansel Petroleum Co
21,000	Quartermaster, CCC, Jefferson Barracks, Mo.	Shreveport, La.	4.69	Western Oil & Fuel
38,500	Indian Service, Crookston, Nebr.	Casper, Wyo.	5.5	Texaco
8,000	Engineer Office, near Brownville, Nebr.	Wichita, Kans.	5.11	Tansel Petroleum Co.
16,000	Engineer Office, Omaha, Nebr.	Wichita, Kans.	5.11	Tansel Petroleum Co.
10,000	Quartermaster, CCC, Fort Crook, Nebr.	Wichita, Kans.	5.11	Tansel Petroleum Co.
24,000	Quartermaster, Omaha, Nebr.	Wichita, Kans.	5.11	Tansel Petroleum Co.
24,000	Indian Service, Rolla, N. Dak.	Shreveport, La.	4.69	Western Oil & Fuel
16,000	Bu. of Prisons, Chillicothe, Ohio	Shreveport, La.	4.69	Western Oil & Fuel
60,000	Quartermaster, Arsenal Switch, Columbus, Ohio	Shreveport, La.	4.69	Western Oil & Fuel
15,000	Quartermaster, Columbus Gen'l Depot, Columbus, O.	Shreveport, La.	4.69	Western Oil & Fuel
8,000	Quartermaster, Osborn, Ohio	Shreveport, La.	4.69	Western Oil & Fuel
8,000	Quartermaster, Wright Field, Ohio	Shreveport, La.	4.69	Western Oil & Fuel
88,000	Indian Service, Pine Ridge, S. Dak.	Casper, Wyo.	5.5	Texaco
7,000	Quartermaster, Camp McCoy, Sparta, Wisc.	Shreveport, La.	4.69	Western Oil & Fuel

V-75 Grade

24,000	Naval Training Station, Great Lakes, Ill.	Shreveport, La.	5.28	Western Oil & Fuel
16,000	Engineer Office, Colona, Ill.	Shreveport, La.	5.28	Western Oil & Fuel
20,000	Chicago Quartermaster Depot, Chicago, Ill.	Shreveport, La.	5.28	Western Oil & Fuel
24,000	Engineer Office, Keokuk, Iowa	Shreveport, La.	5.28	Western Oil & Fuel
56,000	Engineer Office, Pleasant Valley, Iowa	Shreveport, La.	5.28	Western Oil & Fuel
208,000	Quartermaster, Fort Knox, Ky.	Shreveport, La.	5.28	Western Oil & Fuel
8,000	Veterans Administration, Chillicothe, Ohio	Shreveport, La.	5.28	Western Oil & Fuel
7,000	Veterans Administration, Dayton, Ohio	Shreveport, La.	5.28	Western Oil & Fuel

G Grade

21,000	Quartermaster, Jefferson Barracks, Mo.	Shreveport, La.	4.0	Tansel Petroleum Co.

REGION FOUR

V 68 Grade

20,000	Quartermaster, Fort Leavenworth, Kans.	Sugar Creek, Mo.	5.5	Standard
48,000	Quartermaster, Fort Riley, Kans.	McPherson, Kans.	5.5	Saunders Petroleum Co., Kansas City, Mo.
8,000	Navajo Indian Service, Wingate, N. Mex.	El Paso, Tex.	5.125	Sinclair
90,000	United Pueblos Indian Agency, Albuquerque, N. Mex.	El Paso, Tex.	5.125	Sinclair
180,000	Engineer Corps, Newkirk, N. Mex.	Destination, shipped from Amarillo, Tex.	7.24	Texaco
95,375	Field Artillery School, Fort Sill, Okla.	Duncan, Okla., motor tank delivery	5.8	H. C. Stephen & Sons, Shawnee, Okla.
7,000	Quartermaster, Fort Reno, Okla.	Grandfield, Okla.	5.121	Bell Oil & Gas Co., Tulsa
42,000	Quartermaster, Brooks Field, Tex.	Destination, shipped from San Antonio, Tex.	6.5	Texaco
7,000	Quartermaster, Duncan Field, Tex.	Destination, shipped from San Antonio, Tex.	6.5	Texaco
75,100	Quartermaster, Fort Bliss Tex.	Destination, shipped from El Paso, Tex.	6.64	Texaco
20,000	Quartermaster, Brownsville, Tex.	Destination, shipped from Ingleside, Tex.	6.945	Humble
50,000	Quartermaster, Fort Clark, Tex.	Destination, shipped from San Antonio, Tex.	7.2	Texaco
35,000	Quartermaster, Galveston, Tex.	Destination, shipped from Houston, Tex.	6.15	Texaco
49,775	Quartermaster, Fort D. A. Russell, Marfa, Tex.	Destination, shipped from El Paso, Tex.	7.6	Standard of Texas
16,000	Quartermaster, Fort McIntosh, Laredo, Tex.	San Antonio, Tex.	5.36	Texaco
125,000	Quartermaster, Ft. Sam Houston, Tex.	Destination, shipped from San Antonio, Tex.	6.4	Texaco
21,126	Quartermaster, Randolph Field, Tex.	Destination, shipped from San Antonio, Tex.	6.4	Texaco
8,250	Quartermaster ,Rio Grande City, Tex.	Destination, shipped from Ingleside, Tex.	6.945	Humble
114,000	Quartermaster, San Antonio, Tex.	Destination, shipped from San Antonio, Tex.	6.4	Texaco

V-75 Grade

7,000	Ordnance, Arsenal, San Antonio, Tex.	Hodge, Tex.	6.371	Bell Oil & Gas Co., Tulsa
7,000	Quartermaster, Ft. D. A. Russell, Marfa, Tex.	Destination, shipped from El Paso, Tex.	9.4	Texaco

REGION FIVE

V-68 Grade

3-Month Gallonage	Govt. Agency	F.O.B. Point and Shipping Point	Max. Price	Contractor
16,000	Bureau of Reclamation, Grand Junction, Colo.	Craig, Colo.	6.5	Texaco
45,500	Quartermaster, Fitzsimons General Hospital, Bunell, Colo.	Grandfield, Okla.	5.121	Bell Oil & Gas Co.
39,000	Quartermaster, Fort Logan, Colo.	Parco, Wyo.	5.356	California Co., San Francisco Calif.
5,000	Forest Service, Cascade, Idaho	Destination, shipped from Portland, Ore.	11.25	Texaco (Calif.)
45,000	Blackfeet Indian Agency, Ft. Browning, Mont.	Sunburst, Mont.	6.25	Texaco (Calif.)
20,000	Flathead Indian Agency, Agency, Mont.	Sunburst, Mont.	6.25	Texaco (Calif.)
13,000	Fort Belknap Indian Agency, Harlem, Mont.	Sunburst, Mont.	6.25	Texaco (Calif.)
32,000	Glacier National Park, Belton, Mont.	Destination, shipped from Kevin, Mont.	7.0	Big West Oil Co. of Mont., Kevin, Mont.
24,000	Glacier Nat'l Park, Glacier Park, Mont.	Destination, shipped from Kevin, Mont.	7.0	Big West Oil Co. of Mont., Kevin, Mont.
120,000	Yellowstone Nat'l Park, Gardiner, Mont.	Laurel, Mont.	7.49	Independent Sales Co., Billings, Mont.
240,000	Engineer Corps, Wiota, Mont.	Sunburst, Mont.	6.25	Texaco (Calif.)
40,250	Wind River Indian Agency, Fort Washakie, Wyo.	Casper, Wyo.	5.5	Texaco
56,000	Quartermaster, Fort Francis E. Warren, Wyo.	Casper, Wyo.	5.5	Texaco

V-75 Grade

60,800	Fort Peck Indian Agency, Poplar, Mont.	Billings, Mont.	9.0	Yale Oil Corp., Billings, Mont.

REGION SIX

V-68 Grade

10,000	Grand Canyon National Park, Grand Canyon, Ariz.	Los Angeles, Calif.	6.6	Standard of Calif.
40,000	Bu. of Reclamation, Yuma, Ariz.	San Pedro, Calif.	7.82	Tide Water Associated
12,000	Quartermaster, Fort Huachuca, Ariz.	Los Angeles, Calif.	6.2	Standard of Calif.
18,425	Letterman General Hospital, San Francisco, Calif.	Destination, shipped from Avon, Calif. Motor tank truck delivery	8.32	Tide Water Associated
10,000	Naval Ammunition Depot, Hawthorne, Nevada	Destination, shipped from Oakland, Calif.	11.0	Texaco (Calif.)
30,000	Bu. of Reclamation, Klamath Falls, Ore.	Richmond, Calif.	8.79	Richfield
40,000	CCC Gas Station, Motor Pool, Ft. Lewis, Wash.	Destination, shipped from Tacoma, Wash. Motor tank truck delivery	8.82	Tide Water
90,000	Quartermaster, Ft. Lewis, Wash.	Destination, shipped from Tacoma, Wash.	8.82	Tide Water

V-75 Grade

6,500	Veterans Admin. Facility, Whipple, Ariz.	Los Angeles, Calif.	10.593	Standard of Calif.

G Grade

15,000	Quartermaster, Monterey, Calif.	Destination, shipped from Oakland, Calif.	8.95	Texaco (Calif.)
4,500	Engineer Office, Fort Lewis, Wash.	Destination, shipped from Tacoma, Wash. by motor tank truck	8.32	Tide Water

New Patents

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh Street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 25c each. State number of patent and name of inventor when ordering.

May 3, 1938

REFINING

Treatment of hydrocarbon oils—Eugene A. Brownscombe, Aldan, Pa., assignor to Atlantic Refining Co. Filed Apr. 25, 1935. No. 2,115,704.

Process for treatment of stored cracked gasoline—Jacque C. Morrell, Chicago, Ill., assignor to Universal Oil Products Co. Filed Nov. 12, 1934. No. 2,115,781.

Fractional distillation—Harry R. Swanson, White Plains, and John S. Wallis, New York, N. Y., assignors to Foster-Wheeler Corp. Filed Sept. 11, 1930. No. 2,115,793.

Conversion of hydrocarbon oils—Kenneth Swartwood, Chicago, Ill., assignor to Universal Oil Products Co. Filed Aug. 10, 1936. No. 2,115,794.

Process for obtaining valuable products from petroleum residues—Per K. Frolich, Roselle, N. J., assignor to Standard Oil Development Co. Filed Mar. 17, 1933. No. 2,115,846.

Treating mineral oils—Hans F. Lindeke, Martinez, Calif., assignor to Shell Development Co. Filed Apr. 2, 1934. No. 2,115,960.

Purification of mineral oils, tars, their distillation products, and like—Eugen Dorrer, Germany, assignor to Standard-I. G. Co. Filed Oct. 21, 1930. No. 2,116,061.

Production of non-knocking motor fuels—Mathias Pier and Walter Kroenig, Germany, assignors to I. G. Farbenindustrie. Filed Jan. 29, 1936. No. 2,116,081.

Treating lubricating oil—Henry R. Dickinson, Grand Rapids, Mich. Filed July 25, 1935. No. 2,116,144.

Manufacture of motor fuels—Vladimir Ipatieff and Ben B. Corson, Chicago, Ill., assignors to Universal Oil Products Co. Filed Feb. 29, 1936. No. 2,116,151.

Manufacture of motor fuels—Jacque C. Morrell, Chicago, Ill., assignor to Universal Oil Products Co. Filed Jan. 29, 1936. No. 2,116,157.

Process of extracting hydrocarbon material—Durand Churchill, Jr., New York, N. Y., assignor to Standard Oil Development Co. Filed Mar. 13, 1934. No. 2,116,188.

Process of refining—Gideon J. Malherbe, Bronxville, N. Y., assignor to De Laval Separator Co. Filed May 28, 1936. No. 2,116,208.

Purification of oil—Russell P. Dunmire, Alliance, Ohio, assignor to Buckeye Laboratories Inc., same place. Filed Mar. 30, 1935. No. 2,116,344.

Combined oil cracking anl viscosity breaking process—Howard V. Smith, Eldorado, Kans., assignor to Skelly Oil Co. Filed Sept. 11, 1936. No. 2,116,417.

Process and apparatus for treating mineral oils—Merrell R. Fenske, State College, Pa., assignor to Pennsylvania Petroleum Research Corp. Filed June 29, 1935. No. 2,116,428.

Testing of lubricating oils—Wilbert B. McCluer, State College, Pa., assignor to Pennsylvania Petroleum Research Corp. Filed Sept. 14, 1933. No. 2,116,442.

MISCELLANEOUS

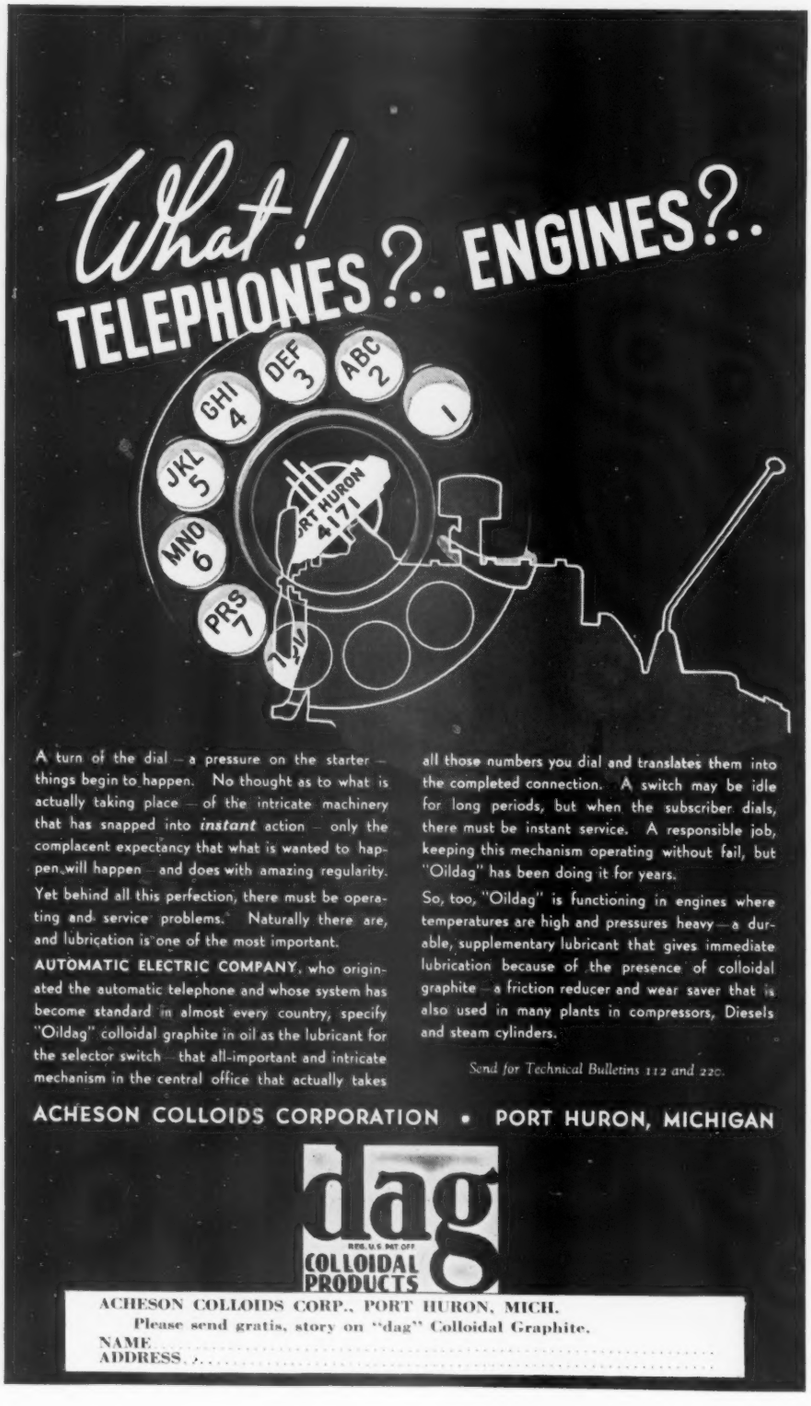
Process for treating oils with sulphuric acid and for preparing improved wetting agents and detergents—Stewart C. Fulton and Hans G. Vesterdal, Elizabeth, N. J., assignors to Standard Oil Development Co. Filed Nov. 9, 1934. No. 2,115,807.

Lubricating composition—Floyd L. Miller and Carl Winning, Elizabeth, N. J., assignors to Standard Oil Development Co. Filed May 23, 1932. No. 2,115,823.

Sulphonic acids from SO_2 extract of light mineral oil distillates—Oliver H. Dawson, Baytown, Tex., assignor to Standard Oil Development Co. Filed Oct. 19, 1934. No. 2,115,843.

Process for treating oils with sulphuric acid and for preparing improved wetting agents and detergents—Edwin J. Gohr, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Nov. 9, 1934. No. 2,115,847.

Rubber substitutes—Peter J. Wiezevich, now by judicial change of name Peter J. Gaylor, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Dec. 30, 1933. No. 2,115,896.



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Yet behind all this perfection, there must be operating and service problems. Naturally there are, and lubrication is one of the most important.

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So, too, "Oildag" is functioning in engines where temperatures are high and pressures heavy—a durable, supplementary lubricant that gives immediate lubrication because of the presence of colloidal graphite—a friction reducer and wear saver that is also used in many plants in compressors, Diesels and steam cylinders.

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Markets

At A Glance . . .

MID-WESTERN: Gasoline offered at lower prices.
MID-CONTINENT: Natural quoted 0.25 to 0.375 cent higher.
EASTERN: Heavy rains stifle interest in gasoline.
PENNSYLVANIA: Interest in lubricating oils revives.
COASTAL: Foreign activity at standstill; prices unchanged.
CALIFORNIA: Atlantic foreign buyers active with inquiries.

Mid-Western

N. P. N. News Bureau

CHICAGO, July 25. — A mixed trend in jobber spot market gasoline buying in the Mid-Western market was reported the past week.

The general demand, sellers reported, was fairly good, but at various times during the week. Some sellers experienced best demand at the opening of the week. Others reported the peak for their sales came at mid-week, and others had a rise in demand at the week end.

Gasoline prices declined with low octane U. S. Motor offered to jobbers 0.25 cent lower. The 70-72 octane grade declined 0.125-cent.

Kerosine demand generally was reported poor. One seller, however, had good demand for kerosine and tractor fuel moving into the northwest states for the harvest season.

Michigan refiners reported gasoline demand was generally good from jobbers on intrastate shipments. One refiner reported liquidation of gasoline inventory last week was about completed and production in the future would be geared to sales.

Pennsylvania

N. P. N. News Bureau

CLEVELAND, July 25.—Virtually all refiners in the Pennsylvania area reported that market conditions for bright stock and neutral oils were more promising the week ended July 23 than they have been since the downward trend of prices for lubricating oils came to a halt late in May.

One refiner reported July 24 that he had raised his price for 25 pour test bright stock 1 cent to 13 cents per gallon. Another reported that inter-refinery sales had been made at 12 cents, pointing out that, while generally a differential of 2 cents under jobber quotations prevails on inter-company sales, conditions the past week have prompted refiners to boost inter-refinery prices to a par with offerings to the jobbing trade.

Another refiner reported that he had withdrawn offerings of bright stock and neutral oil late July 24, preferring to hold the oil rather than offer at current prices.

The turn-about in the lubricating oil situation in Pennsylvania was credited generally to an increase in shipments against contracts, coupled with a lessening of supply which has resulted in sizable cuts in refinery inventory in the field.

Fuel oil continued scarce, particularly in the lower district. More offerings of this product were reported at the highs of price ranges.

U. S. Motor gasoline was offered at 5 cents by at least one seller in the lower district. However, other suppliers of this product said that movement was fair, and some sales of this grade were reported at 5.25 cents.

Coastal

N. P. N. News Bureau

NEW YORK, July 25.—Foreign activity in lubricating oils, gasoline, kerosine and fuel oils showed no signs of shaking itself loose from the lethargy which has gripped it the past several weeks. Inquiries from foreign buyers were conspicuous by their absence, while buying was virtually at a complete standstill. Even the normal amount of "market feelers" was lacking.

Traders here were at loss to account for the complete absence of activity. Several expressed the thought that perhaps Mexican crude and products, or even the possibility of oil from this country being thrown on the World market shortly was influencing buyers to hold off.

Russia has been active recently, taking the lion's share of the fuel oil business for the French Navy. A small portion of this business was reported to have gone to European major companies, with affiliated companies in the United States, but no American oil company received any part of this business, according to the same reports.

Roumania has been relatively inactive as a source for gasoline the past several weeks, but traders here said they expected that this source would again be offering in the near future.

Gas oil and gasoline were without change during the third week of July. Bunker C fuel oil grew weaker, traders reported. However, reports of offerings of this oil at $0.60 could not be confirmed up to the end of the week

California

N. P. N. News Bureau

LOS ANGELES, July 23. — Inquiry for California petroleum took a vacation last week as suppliers reported a definite lack of interest. One Atlantic foreign buyer sought prices on a cargo of 64 minimum octane gasoline for August lifting, but local suppliers doubted ability to meet Gulf competition. A nominal quotation of 5 cents was made in one instance, and others willing to shade this slightly were not optimistic.

Atlantic foreign interests also made exploratory soundings for prices on gas oil and kerosine distillate in cargo lots. Indications were they would pay 2.5 to 2.75 cents for the former and about a cent a gallon higher for kerosine distillate, which are respectively, almost a cent less than the value placed on these products by west coast suppliers.

A desire to unload fuel oil prompted lower quotations on 100,000 barrels of the product to be delivered to the U. S. Navy at Pearl Harbor, Hawaii, according to reports. Tide Water Associated Oil Co. was indicated successful bidder with a price of 83 cents a barrel, delivered. Observers said, that figuring only cost for transportation, this would net less than 55 cents a barrel, California. Shell Oil Co.'s bid was also reported as 83 cents, but included the qualification that the quantity must be taken in two tankers. General Petroleum Corp. at 83.9, Richfield at 86 and Union at 89 cents, were other reported bids.

Domestic gasoline markets were unsettled the past week. A 0.25-cent reduction of rack and delivered prices by one large independent refiner, to 6.75 and 7.25 cents, respectively,—7 cents for deliveries of 3000 gallons or

N. P. N. Gasoline Index

	Dealer T.w. Cents per	Tank Car gal.
July 25	10.24	5.99
Month ago	10.18	6.18
Year ago	10.67	6.77

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 12 wholesale markets for regular-grade gasoline.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon except heavy fuel oils in dollars per barrel of 42 gallons, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Gasoline

Prices Effective	July 25	July 18
OKLAHOMA		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.75 - 5.00	4.75 - 5.00
63-66 oct.	5.00 - 5.125	5.00 - 5.125
67-69 oct.	5.25 - 5.50	5.25 - 5.50
70-72 oct.	5.50 - 5.75	5.50 - 5.75
60-62, 400 e.p.	4.75 - 4.875	4.75 - 4.875
WESTERN PENNA.		
Bradford-Warren:		
Motor gasoline:		
U. S. Motor (58-62°)	5.375- 5.50	5.375- 5.50
Min. 65 oct.	7.00 - 7.25	7.00 - 7.25
Min. 70 oct.	(e)7.50	(e)7.50
Other districts:		
Motor gasoline:		
U. S. Motor (58-62°)	5.00 - 5.25	5.25
Min. 65 oct.	7.00	7.00
CENTRAL MICHIGAN (a)		
Str.-Run Gasoline	(c)4.75 - 5.50	(c)4.75 -5.50
U. S. Motor: (Octane L-3)		
67-69 octane	(e)7.50	(f)
70-72 octane	8.00 - 8.25	8.00 - 8.25
CALIFORNIA (3c tax to be added if used in state)		
U. S. Motor:		
54-58, for instate shipment	6.75 - 9.25	6.75 - 9.25
54-58, for outside state shipment	6.75 - 9.00	6.75 - 9.00
58-61, 375-400 e.p., 65 oct. & above	7.75 - 9.75	7.75 - 9.75
N. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.75 - 5.00	4.75 - 5.00
63-66 oct.	5.00 - 5.50	5.00 - 5.50
67-69 oct.	5.25 - 5.625	5.25 - 5.625
70-72 oct.	5.625- 5.75	5.625- 5.75
60-62, 400 e.p.	4.75	4.75
KANSAS (For Kansas destinations only)		
U. S. Motor: (Octane L-3)		
62 oct. & below	5.00 - 5.25	5.00 - 5.25
70-72 oct.	5.75 - 6.00	5.75 - 6.00
W. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.875- 5.00	4.875- 5.00
63-66 oct.	5.125- 5.25	5.125- 5.25
67-69 oct.	5.50 - 5.625	5.50 - 5.625
70-72 oct.	5.75 - 5.875	5.75 - 5.875
E. TEX.		
60-62, 400 e.p.	4.625- 4.75	4.625- 4.75
N. LA. (For shipment to La. & Ark.)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.75	4.75
63-66 oct.	(e)5.125	(e)5.125
67-69 oct.	(e)5.25	(e)5.25
70-72 oct.	5.75	5.75
ARKANSAS (F.o.b. Ark. plant of one refiner, for shipment to Ark. & La.)		
U. S. Motor: (Octane L-3)		
62 octane & below	5.00	5.00
67-69 oct.	5.50	5.50
OHIO (Quotations of S. O. Ohio. Delivered anywhere in Ohio).		
U. S. Motor	8.375	8.375
Above 65 oct.	8.625	8.625

Natural Gasoline

(Prices to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

F.O.B. GROUP 3		
Grade 26-70	3.00	2.625
F.O.B. BRECKENRIDGE		
Grade 26-70	2.75	2.50 - 2.625
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	6.50 - 7.00	6.50 - 7.00

Kerosine

Prices Effective	July 25	July 18
WESTERN PENNA.		
Bradford-Warren:		
45 w.w.	5.125- 5.25	5.125- 5.25
46 w.w.	5.25 - 5.375	5.25 - 5.375
Other districts:		
45 w.w.	5.00 - 5.25	5.00 - 5.25
46 w.w.	5.125	5.125
47 w.w.	5.25 - 5.375	5.25 - 5.375
CENTRAL MICHIGAN (a)		
47-49 w.w.	4.80 - 5.25	4.625- 5.25
OKLAHOMA		
41-43 w.w.	4.25 - 4.375	4.25 - 4.375
42-44 w.w.	4.50 - 4.625	4.50 - 4.625
KANSAS (For Kansas destinations only).		
41-43 w.w.	4.625	4.625
42-44 w.w.	4.875- 5.00	4.875- 5.00
N. TEX. (b)		
41-43 w.w.	(e)4.25	(e) 4.25 - 4.50
E. TEX.		
41-43 w.w.	(f)	(f)
N. LA. (For shipment to La. and Ark.)		
41-43 w.w.	4.125- 4.50	4.125- 4.50
ARK. (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
41-43 w.w.	4.625	4.625
CALIFORNIA		
40-43 w.w.	5.00 - 7.00	5.00 - 7.00

Gas *and* Fuel Oils

Prices Effective	July 25	July 18
WESTERN PENNA.		
Bradford-Warren:		
36-40	3.875- 4.00	3.875- 4.00
Other districts: (Excluding Pittsburgh District Prices).		
36-40	3.625- 3.75	3.625- 3.75
CENTRAL MICHIGAN (a)		
P.W. Distillate	4.50 - 4.75	4.25 - 4.75
No. 3 gas oil, Str.	3.875- 4.25	3.75 - 4.25
U.G.I. gas oil	3.50 - 4.00	3.50 - 4.25
Fuel Oils (Vis. at 100):		
500-700 Vis.	2.50 - 2.75	(d)2.00
300-500 Vis.	2.625- 3.00	(d)2.25
130-300 Vis.	2.75 -3.25	(d) 2.75 - 3.00
OKLAHOMA		
No. 1 prime white	3.75 - 4.00	3.75 - 4.00
No. 2 straw	3.375- 3.625	3.375- 3.625
U. G. I. gas oil	(d)3.00 -3.25	(d) 3.00 - 3.25
28-30 zero fuel	3.25 - 3.375	3.25 - 3.375
24-26 fuel	(e)$0.925	(e)$0.925
18-22 fuel	(d) $0.775-$0.85	(d) $0.775-$0.85
14-16 fuel	(d)$0.70 -$0.80	(d) $0.70 -$0.80
KANSAS (For Kans. destinations only).		
No. 1 p.w. fuel oil	4.125	4.125
10-14 fuel oil	$0.45 -$0.80	$0.45 -$0.80
N. TEX. (b)		
No. 1 Prime white	(e)4.00	(e)4.00
N. LA. (For shipment to La. and Ark.)		
No. 2 fuel	(f)	(f)
20-24 fuel	(e) $1.10-$1.15	(e) $1.10-$1.15
16-20 fuel	(e) $0.90-$0.95	(e) $0.90-$0.95
10-14 fuel	(e) $0.80-$0.85	(e) $0.80-$0.85
ARK. (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
No. 2 fuel	3.625	3.625
28-30 gas oil, zero	3.375	3.375
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.60 -$0.75	$0.60 -$0.75
Light fuel	$0.75 -$0.85	$0.75 -$0.85
Diesel fuel (per gal.)	3.00 - 4.00	3.00 - 4.00
Stove dist. (per gal.)	3.50 - 6.00	3.50 - 6.00
Los Angeles:		
Heavy fuel	$0.50 -$0.90	$0.50 -$0.90
Light fuel	$0.65 -$1.00	$0.65 -$1.00
Diesel fuel (per gal.)	2.50 - 4.00	2.50 - 4.00
Stove dist. (per gal.)	2.75 - 6.00	2.75 - 6.00
San Francisco:		
Heavy fuel	$0.95	$0.95
Light fuel	$1.05	$1.05
Diesel fuel (per gal.)	4.50	4.50
Stove dist. (per gal.)	6.50	6.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

Prices Effective	July 25	July 18
WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)		
Viscous Neutrals No. 3 col. (*Viscosity at 70° F.*)		
200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	15.00 -17.00	15.00 -17.00
10 p.t.	14.00 -16.00	14.00 -16.00
15 p.t.	13.50 -15.50	13.50 -15.50
25 p.t.	12.00 -14.00	12.00 -14.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	14.00 -15.50	14.00 -15.50
10 p.t.	13.00 -14.50	13.00 -14.50
15 p.t.	12.50 -14.00	12.50 -14.00
25 p.t.	11.00 -12.50	11.00 -12.50

SOUTH TEXAS

Vis. Color		
Pale Oils: (*Vis. at 100°F.*)		
100 No. 1½-2½	4.75 - 5.00	4.75 - 5.00
200 No. 2-3	6.25	6.25
300 No. 2-3	6.75	6.75
500 No. 2½-3½	7.75	7.75
750 No. 3-4	8.25	8.25
1200 No. 3-4	8.75	8.75
2000 No. 4	9.00 - 9.25	9.00 - 9.25
Red Oils:		
200 No. 5-6	6.25	6.25
300 No. 5-6	6.75	6.75
500 No. 5-6	7.75	7.75
750 No. 5-6	8.25	8.25
1200 No. 5-6	8.75	8.75
2000 No. 5-6	9.00 - 9.25	9.00 - 9.25

Note: Red oil prices cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis).

Pale Oils: (0 to 10 P.P.)		
Vis. Color		
60-85—No. 2	5.50	5.50
86-110—No. 2	6.00	6.00
150—No. 3	9.00	9.00
180—No. 3	10.00	10.00
200—No. 3	10.50	10.50
250—No. 3	11.50	11.50
280—No. 3	12.50	12.50
300—No. 3	13.00	13.00
Red Oils:		
180—No. 5	(e)9.00	(e)9.00
200—No. 5	9.50 -10.00	9.50 -10.00
280—No. 5	11.50 -11.75	11.50 -11.75
300—No. 5	(e)11.75	(e)11.75

Note: The following oils, of 15 to 25 p.p., are generally quoted these amounts under 0-10 p.p.; viscous oils, 0.5c; non-viscous, 0.25c. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)

Pale Oils 0 to 10 p.p.:		
Vis. Color		
60-85—No. 2	7.25	7.25
86-110—No. 2	7.75	7.75
150—No. 3	10.00	10.00
180—No. 3	11.00	11.00
200— .3	11.50	11.50
250—No. 3	12.50	12.50
Red Oils:		
180—No. 5	10.00	10.00
200—No. 5	10.50	10.50
250—No. 5	11.50	11.50
280—No. 5	12.50	12.50
300—No. 5	12.75	12.75

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa basis)

Bright Stocks:		
190-200 Vis. at 210 °D.	(e)19.00	(e)19.00
150-160 Vis. at 210°D:		
0 to 10 p.p.	14.25 -16.00	14.25 -16.00
10 to 25 p.p.	13.50 -15.50	13.50 -15.50
25 to 40 p.p.	13.50 -15.00	13.50 -15.00
150-160 vis. at 210° E.	12.50 -15.00	12.50 -15.00

(a) Prices f.o.b. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments. (c) Excluding Detroit shipment. (d) Nominal. (e) Only one refiner quoting. (f) No quotations reported

MARATHON LUBRICANTS

RADIATION OF QUALITY

Quality in petroleum products is essential to the rapid and successful building of an oil jobbing business. This year the demand for MARATHON LUBRICANTS has reached a new high, offering aggressive distributors who are looking for a fast moving quality product an unequaled opportunity for volume sales and profits.

Give your customers the extra protection of the world's finest lubricants at no extra cost and watch your sales volume and profits climb. Take advantage of the exclusive territory franchise offered by The Ohio Oil Company.

WRITE PHONE WIRE

MARATHON PRODUCTS BEST IN THE LONG RUN

LINCO

THE OHIO OIL COMPANY

GENERAL OFFICES - - - - FINDLAY, OHIO

ROBINSON, ILLINOIS TULSA, OKLAHOMA FT. WORTH, TEXAS

more was said to have been the cause of a general softening of third grade prices quoted by independents.

Reports that major and large independent marketers would insist upon maintenance of nominated retail prices, as a means of curbing undercanopy price cutting, held promise of improving the whole Pacific Coast marketing picture.

Mid-Continent

N. P. N. News Bureau

TULSA, July 25. — Stimulated by what was said to be a temporary shortage of supplies, Grade 26-70 natural gasoline prices advanced 0.25 to 0.375 cent in the Mid-Continent last week. Supplies available for immediate shipment were said to be especially closely held, and it took higher bids to bring out offerings. Scarcity of available supplies was attributed to the fact most manufacturers were making low vapor pressure natural. At higher prices, buyers reported some manufacturers indicated they would switch production to Grade 26-70.

Refined oil shipments from several Mid-Continent districts were reported below the pre-holiday peak. Several factors were reported responsible for this lack of active demand. In the first place, it was said that some jobbers and at least one refiner had "overbought" in anticipation of heavy Independence Day gasoline consumption. Gasoline in storage at some bulk plants, purchased prior to July 4, was just now being used, according to some reports.

Replacement buying was slow in getting under way, it was reported, due to increased offerings from one or two Mid-Continent districts and from other refining centers. More liberal offerings were said to have made jobbers wary. Another disturbing factor was a reported weakness in retail gasoline markets throughout much of the Mid-Continent's marketing territory. Despite unfavorable conditions, however, Mid-Continent gasoline prices were reported unchanged last week.

Kerosine shipments were smaller last week as use of this product as tractor fuel was reported lighter.

Mid-Continent and South Texas lube markets were featureless. Buying continued light. Wax was closely held, with demand reported active.

Eastern

N. P. N. News Bureau

NEW YORK, July 25.—In the face of heavy rains throughout much of the marketing territory along the eastern seaboard, and with fuel oils stealing most of the attention of traders, interest in gasoline lagged the week ended July 23. No price changes of

(*Continued on page* 52)

Fuel Oil . . . . .

CHICAGO, July 25. — Increased industrial buying of heavy fuels featured the Mid-Western market last week. The additional buying was from plants increasing the number of tank cars ordered, and from plants re-entering the market for supplies.

Several sellers reported industrial business better than a month ago. One seller estimated the gain in his business amounted to about 33 per cent.

Jobbers continued to shop around for heating oils, sellers reported, with some buying for storage against the coming heating season.

In the Michigan fuel oil market only one refiner was quoting at the week end. Other plants reported output sold up, from four days to the end of the year.

One refiner announced closing a contract for 70,000 barrels of heavy fuel. The contract was with an industrial plant converting from coal to oil. The contract, along with other commitments, took the refinery out of the market until the end of the year.

* * *

TULSA, July 25. — Little buying interest in Mid-Continent light fuels was being shown by northern heating oil distributors last week. Refiners indicated storage purchases probably were being made in refining districts nearer points of consumption. Although demand was inactive, there was said to be little inclination on part of Mid-Continent refiners to push light fuels on the open market.

Railroad consumption of heavy fuel was said to be disappointing last week as tonnage was reported off. Refinery operations, however, were being kept at a minimum, refiners said, in order to preclude further increases in stocks of these oils.

* * *

NEW YORK, July 25.—Fuel oil markets held the spotlight of trade attention in the East the week ended July 23, as independent suppliers and major companies reported price advances in several of the key markets along the eastern seaboard.

This was particularly true in the New York harbor market, where quotations reported the past several weeks hardly covered the price at the Gulf, plus transportation to the harbor market.

Many independents said they had advanced Nos. 2 and 4 oils 0.25 cent. Kerosine and No. 1 oil were advanced 0.125 cent by independent suppliers, in New York.

Movement of fuel oil was reported better in some markets. Sellers said that purchases generally were made at this time of year against the possibility of an advance in price.

Accepts A.P.I. Post

NEW YORK, July 19.—F. S. Reitzel, Sun Oil Co., Philadelphia, has accepted temporarily the chairmanship of the American Petroleum Institute's Committee on Uniform Methods of Oil Accounting, succeeding the late A. M. Brereton, The Pure Oil Co., according to W. R. Boyd, Jr., executive vice-president of the Institute.

TANK WAGON MARKETS, HEATING OILS

Prices in Effect July 25, 1938

Following are posted tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

S. O. NEW JERSEY

	No. 1	No. 2	No. 4
Atlantic City, N. J.	8.0	6.0	6.0
Newark	8.0	6.0	6.0
Annapolis, Md	....	6.25	....
Baltimore	7.5	6.5	6.5
Washington, D. C.	7.75	6.5	6.5
Norfolk, Va	7.0	6.0	6.0
Petersburg	7.25	6.25	....
Richmond	7.25	6.25	6.25
Charlotte, N. C.	8.75	7.75	....
Hickory	....	8.0	....
Raleigh	8.75	7.25	....
Charleston, S. C.	8.5	7.0	....
Columbia	9.8	8.3	....
Spartanburg	10.7	9.2	....

SOCONY-VACUUM OIL CO. INC.
(S. O. New York Division)

	No. 2	No. 3	No. 4
New York City	6.50	6.50	6.50
Albany, N. Y.	7.00	7.00	6.50
Rochester, N. Y.	7.50	7.50	7.50
Boston, Mass	6.00	6.00	6.00
Bangor, Me	7.50	7.50	7.50
Manchester, N. H.	7.00	7.00	7.00
Burlington, Vt	8.00	8.00	8.00
Hartford, Conn	6.00	6.00	6.00
New Haven, Conn	5.25	5.25	5.25
Providence, R. I.	6.00	6.00	6.00

Note: Prices for No. 1 fuel in Socony-Vacuum territory same as for kerosine which see in tank wagon table for various cities; prices change with kerosine.

ATLANTIC REFINING Cont'd

	No. 1	No. 2	No. 3	No. 4
Philadelphia, Pa.	7.75	7.00	7.00	7.00
Allentown, Pa.	8.25	7.50	7.50	7.50
Wilmington, Del.	8.25	7.50	7.50	7.50
Springfield, Mass.	9.00	7.50	....	7.50
Worcester, Mass.	9.00	7.50	....	7.50
Hartford, Conn.	9.00	7.50	....	7.50

S. O. OHIO

Columbus Division and Cleveland	7.50	7.50	7.00	....
City of Lima	8.00	8.00	7.00	....
Rest of Ohio	8.00	8.00	7.50	....

Note: S. O. Ohio prices are for full compartment hose dumps, bucket dumps are 0.5c per gallon higher.

S. O. INDIANA
Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	(a)6.5	6.5
Indianapolis	...	(b)7.8
Detroit	...	7.1
Milwaukee	8.4	7.7
Minneapolis	7.8	7.8
St. Louis	7.7	7.0
Kansas City	6.8	6.8

(a) For 400 gals. and over; 150 to 399 gals., 7c; 1 to 149 gals., 8c.
(b) Excluding 4c state tax.
Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel of 42 gallons, wax and petrolatums in cents per pound in barrels, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Cylinder Stocks (cont'd)

Prices Effective	July 25	July 18
Mid-Continent (cont'd)		
120 Vis. at 210° D		
0 to 10 p.p.	14.50 –15.125	14.50 –15.125
25 to 40 p.p.	(e)14.25	(e)14.25
600 S.R. Dark Green	5.00 – 7.50	5.00 – 7.50
600 S.R. Olive Green	6.50 – 7.50	6.50 – 7.50
631 S.R.	(e)12.50	(e)12.50
Black Oil	3.50 – 4.00	3.50 – 4.00
CHICAGO (Viscosity at 210°)		
Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210. No. 8 color:		
0 to 10 p.p.	15.75	15.75
15 to 25 p.p.	14.75	14.75
30 to 40 p.p.	14.25	14.25
E filtered Cyl. Stock	13.50	13.50

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

Prices Effective	July 25	July 18
WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)		
600 S.R. filterable	8.00 – 8.50	8.00 – 8.50
650 S.R.	10.00 –10.50	10.00 –10.50
600 fl.	10.50 –11.00	10.50 –11.00
630 fl.	13.00 –14.00	13.00 –14.00
Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:		
10 p.t.	14.50 –15.50	14.50 –15.50
15 p.t.	13.50 –14.50	13.50 –14.50
25 p.t.	12.00 –14.00	12.00 –14.00

Petrolatums

Prices Effective	July 25	July 18
WESTERN PENNA. (In bbls., carloads; in tank cars, 0.5c less)		
Snow White	6.125– 6.25	6.125– 6.25
Lily White	5.125– 5.25	5.125– 5.25
Cream White	4.125– 4.25	4.125– 4.25
Light Amber	2.625– 2.75	2.625– 2.75
Amber	2.375– 2.50	2.375– 2.50
Red	2.00 – 2.25	2.00 – 2.25

Wax

Prices Effective	July 25	July 18
WESTERN PENNA. (In bbls., carloads, New York)		
122-124 A.m.p., w.c. scale	2.25 – 2.35	2.25 – 2.35
124-126 A.m.p., w.c. scale	2.25 – 2.35	2.25 – 2.35
OKLAHOMA (In bbls. or burlap bags, carloads)		
124-126 A.m.p., w.c. scale	2.25	2.25
CHICAGO (In bags, carload lots. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)		
Fully refined:		
122-124	4.25	4.25
125-127	(d)4.35	(d)4.35
127-129	(d)4.45	(d)4.45
130-132	(d)4.75	(d)5.10
132-134	(d)5.00	(d)5.35
135-137	(d)5.75	(d)6.10

(a) Nominal. (b) Only one refiner quoting. (c) No price reported. (d) Same prices quoted in bags or slabs loose.

MID-WESTERN TANK CAR MARKET

(Prices group 3 basis; origin of shipments unknown)

Gasoline

Prices Effective	July 25	July 18
U. S. Motor: (Octane L-3)		
62 oct. and below	4.375– 5.00	4.375– 5.00
63-66 oct.	4.75 – 5.25	4.75 – 5.00
67-69 oct.	4.875– 5.375	5.00 – 5.25
70-72 oct.	5.00 – 5.625	5.125– 5.625

Kerosine

41-43 w.w.	3.625– 4.25	3.75 – 4.25
42-44 w.w.	3.625– 4.50	3.75 – 4.375

(a) Nominal.

Fuel and Gas Oils

Prices Effective	July 25	July 18
Domestic:		
No. 1 p.w.	3.50 – 3.875	3.50 – 3.875
No. 1 straw	3.375– 3.875	3.50 – 3.625
No. 2 straw	3.125– 3.625	3.25 – 3.625
No. 3	3.00 – 3.25	3.00 – 3.25
No. 5	(a)$0.65-$0.75	(a) $0.65-$0.75
Range oil	3.625– 4.00	3.875
Industrial:		
No. 5	(a)$0.60-$0.65	(a) $0.60-$0.65

Prices Effective	July 25	July 18
Industrial (cont'd)		
No. 6	(a)$0.40-$0.50	(a) $0.40-$0.50
U. G. I. gas oil	(a)2.875– 3.00	2.875– 3.00

Naphtha and Solvent

Stoddard solvent	5.875	5.875
Cleaners' naphtha	6.375	6.375
V. M. & P. naphtha	6.375	6.375
Mineral spirits	5.375	5.375
Rubber solvent	6.375	6.375
Lacquer diluent	7.375	7.375

DAILY GASOLINE PRICES

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended July 22, 1938)

U. S. Motor, (Octane Number determined according to L-3 Method in Okla., Texas and Mid-Western Districts):	July 18	July 19	July 20	July 21	July 22
62 octane and below:					
Oklahoma	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
(b) North Texas	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
West Texas	4.875– 5.00	4.875– 5.00	4.875– 5.00	4.875– 5.00	4.875– 5.00
Mid-Western (Group 3 basis)	4.375– 5.00	4.375– 5.00	4.375– 5.00	4.375– 5.00	4.375– 5.00
63-66 octane:					
Oklahoma	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
(b) North Texas	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
West Texas	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25
Mid-Western (Group 3 basis)	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.625– 5.25	4.625– 5.25
67-69 octane:					
Oklahoma	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
(b) North Texas	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625	5.25 – 5.625
West Texas	5.50 – 5.625	5.50 – 5.625	5.50 – 5.625	5.50 – 5.625	5.50 – 5.625
Mid-Western (Group 3 basis)	5.00 – 5.25	5.00 – 5.25	4.875– 5.25	4.875– 5.25	4.875– 5.25
70-72 octane:					
Oklahoma	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
(b) North Texas	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75	5.625– 5.75
West Texas	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875
Mid-Western (Group 3 basis)	5.125– 5.625	5.125– 5.625	5.125– 5.625	5.00 – 5.625	5.00 – 5.625
Motor Gasoline, 60-64 octane:					
New York harbor	(a)6.50 –6.75	(a)6.50 –6.75	(a)6.50 –6.75	(a)6.50 –6.75	(a)6.50 –6.75
Philadelphia district	(a)6.50	(a)6.50	(a)6.50	(a)6.50	(a)6.50
Baltimore district	(a)6.50	(a)6.50	(a)6.50	(a)6.50	(a)6.50
Motor Gasoline, 65 octane & above:					
New York harbor	(a)6.75 –7.00	(a)6.75 –7.00	(a)6.75 –7.00	(a)6.75 –7.00	(a)6.75 –7.00
Philadelphia district	(a)6.75	(a)6.75	(a)6.75	(a)6.75	(a)6.75
Baltimore district	(a)6.75	(a)6.75	(a)6.75	(a)6.75	(a)6.75
U. S. Motor, 58-62°:					
Bradford-Warren (Western Penna.)	5.375– 5.50	5.375– 5.50	5.375– 5.50	5.375– 5.50	5.375– 5.50
Other districts (Western Penna.)	5.25	5.25	5.25	5.00 – 5.25	5.00 – 5.25
Motor Gasoline, Min. 65 octane:					
Bradford-Warren (Western Penna.)	7.00 – 7.25	7.00 – 7.25	7.00 – 7.25	7.00 – 7.25	7.00 – 7.25
Other districts (Western Penna.)	7.00	7.00	7.00	7.00	7.00
Motor Gasoline, Min. 70 octane:					
Bradford-Warren (Western Penna.)	(c)7.50	(c)7.50	(c)7.50	(c)7.50	(c)7.50

(a) Nominal. (b) For shipment to Texas and New Mexico destinations; Group 3 prices are quoted on northern shipment. (c) Only one refiner quoting.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tax wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect July 25, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Esselene
(Regular Grade)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J.	7.4	9.4	4	8
*Newark, N. J.	7.4	9.4	4	‖
Annapolis, Md.	8.35	9.85	5	9.5
Baltimore, Md.	7.75	9.25	5	9
Cumberland, Md.	9.15	11.65	5	10
Washington, D. C.	‖	9.5	3	9.5
Danville, Va.	8.45	10.95	6	12.9
Norfolk, Va.	7.25	9.75	6	11.5
Petersburg, Va.	7.55	10.05	6	11.7
Richmond, Va.	7.55	10.05	6	11.7
Roanoke, Va.	8.75	11.25	6	12.9
Charleston, W. Va.	8.55	11.05	6	12.6
Parkersburg, W. Va.	7.85	9.35	6	11.2
Wheeling, W. Va.	8.85	10.25	6	12.2
Charlotte, N. C.	9.15	11.65	7	12.1
Hickory, N. C.	9.65	12.15	7	12.5
Mt. Airy, N. C.	9.45	11.95	7	12.3
Raleigh, N. C.	8.75	11.25	7	11.6
Salisbury, N. C.	9.25	11.75	7	12.2
Charleston, S. C.	7.75	10.25	7	10.6
Columbia, S. C.	8.75	11.25	7	11.6
Spartanburg, S. C.	9.45	11.95	7	12.4

Discount to undivided dealers: Dealer t.w. price less 0.5c per gal.

*Effective June 21, 1938, S. O. New Jersey posted a minimum retail resale price of 11.9c at these two points.

Note: While the above posted prices continue in New Jersey, dealers will pay a net price of 8.9c per gal. for Essolene. Dealers having pumps marked only Esso, Essolene and "Standard" White gasoline will pay 8.4c per gal. for Essolene.

Price basis to commercial consumers: To contract accounts, purchasing at least one full compartment at a time by hose connection: Effective March 12, 1937, in New Jersey, and March 8 in Maryland, District of Columbia, and in Arlington and Fairfax Counties in Virginia, on yearly purchases: from 2,500 to 100,000 gals., consumer t.w. price at time and place of delivery; 100,000 gals. per year consumer tank car price, plus 0.5c per gal. Generally consumer t.w. price in foregoing states is equivalent of dealer t.w. price, less 0.5c per gal.

Effective May 15, 1937, on Essolene and Esso (by tank wagon) in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax Counties, which see above), commercial consumers taking deliveries of 50 gals. (West Va. 100 gals.) or more at one time will be billed at the posted consumer t.w. price. Deliveries less than 50 gals. (West Va. 100 gals.) will be billed at 4c per gal. over posted consumer t.w. price. Generally, posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Kerosine Discount: 1c off t.w. price for 25 gals., or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)

Socony Mobilgas
(Regular Grade)

	Consumer Tank Car	"Split" Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.5	8.9	*5	8
Borough of Richmond (Staten Is.)	7.5	8.9	*5	8
Albany, N. Y.	7.8	9.8	5	8.5
Binghamton, N. Y.	9	10.6	5	9
Buffalo, N. Y.	8.4	9.5	5	8
Jamestown, N. Y.	8.1	10.6	5	8.25
Plattsburg, N. Y.	8.3	10.3	5	9.5
Rochester, N. Y.	8.5	10.3	5	8.5
Syracuse, N. Y.	8.1	9.5	5	9
Danbury, Conn.	8.1	10.1	4	9
Hartford, Conn.	7.9	9.9	4	7
New Haven, Conn.	7.8	9.8	4	7
Bangor, Me.	8.25	10.3	5	9
Portland, Me.	7.75	10	5	8.75
Boston, Mass.	7.50	9	4	8
Concord, N. H.	8.8	10.5	5	9
Lancaster, N. H.	9.7	12	5	10.25
Manchester, N. H.	8.6	10	5	8.5
Providence, R. I.	7.50	9	4	‖
Burlington, Vt.	8.4	10.4	5	9.5
Rutland, Vt.	8.6	10.7	5	9

*Plus 2% city sales tax computed at time of each sale.

Discount to undivided dealers: 0.5c less than "split" dealer t.w.

Price basis to commercial consumers: Effective about Nov. 15, 1936 in New York and New England for tank wagon delivery: monthly purchases of 25,000 gals. or over, pay consumer tank car price at point of delivery, plus 0.5c gal.; monthly purchases of 5,000 to 25,000 gals., pay undivided dealer tank wagon price at point of delivery; monthly purchases of less than 5,000 gals., pay divided dealer tank wagon price at point of delivery. Private consumers pay undivided dealer tank wagon price at point of delivery, plus 2c gal.

Atlantic Refining

Atlantic White Flash Gasoline
(Regular Grade)

	Commercial Tank Car	Dealer T.W.	Gasoline S.S.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	7.25	8.75	12	5	10
Pittsburgh	8	10	15	5	10.5
Allentown	7.75	9.25	**	5	10.5
Erie	8	9.5	**	5	10
Scranton	8	9.5	**	5	10.5
Altoona	8	10	**	5	10.5
Harrisburg	7.5	9	**	5	10.5
Williamsport	8	10	**	5	10.5
Dover, Del.	...	8.5	**	5	10.5
Wilmington	...	7.5	**	5	9.75
Boston, Mass.	...	9	**	4	8
Springfield, Mass.	...	9.5	**	4	8
Worcester, Mass.	...	9	**	4	8 5
Fall River, Mass.	...	9	**	4	8
Hartford, Conn.	...	9.6	**	4	7
New Haven, Conn.	...	9.5	**	4	7
Providence, R. I.	...	9	**	4	8
Atlantic City, N. J.	...	8.60	**	4	8
Camden, N. J.	...	8.60	**	4	8
Trenton, N. J.	...	8.60	**	4	8
Annapolis, Md.	...	9.85	**	5	9.5
Baltimore, Md.	...	9.25	**	5	9
Hagerstown, Md.	...	10.35	**	5	10
Richmond, Va.	...	10.05	**	6	11.7
Wilmington, N. C.	...	10.35	**	7	10.8
Brunswick, Ga.	...	10	**	7	*13
Jacksonville, Fla.	...	8.5	**	8	11

*Georgia has kerosine tax of 1c per gal., not included in above price.

**Atlantic Refining transferred stations to dealers; no prices available.

Discount to undivided dealers: Dealer t.w. less 0.5c per gal. except in Georgia and Florida, dealer t.w. and undivided dealer price is same.

Price basis to commercial consumers: consumers under contract, in Penna. and Delaware, effective Mar. 11, 1937, on yearly gasoline purchases taking full compartment hose deliveries, using 100,000 gals. or more per year, tank car price plus 0.5c per gal.; consumers taking less than 100,000 gals., undivided dealer price. Consumers under contract and not under contract, taking less than full compartment delivery, and consumers not under contract taking full compartment delivery, get divided dealer price. Consumers taking less than 25 gals., t.w. delivery, get 4c above undivided dealer price.

Discount on kerosine: Effective Oct. 29, 1936, in Pennsylvania and Delaware, 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio

Sohio X-70 Gasoline
(Regular Grade)

	Consumer T.W.	†Divided Dlr.	Gasoline Taxes	Kerosine T.W.
Ohio State-wide	11.5	10.5	5	*12
Counties where prices are below statewide: Butler, Clark, Clinton, Columbiana, Defiance, Greene, Montgomery, Pickaway and Preble	11	10	5	....
Hamilton	11	9.5	5	....
Franklin, Knox, and Paulding:	10.5	9.5	5	....

Renown Gasoline
(Third Grade)

Ohio State-wide	11	10	5	....
Counties where prices are below statewide: Hamilton	11	9.5	5	....
Clark, Columbiana, Defiance and Pickaway	10.5	9.5	5	....
Franklin, Knox, and Paulding:	10	9	5	....
Counties where prices are above statewide: Clermont, Darke, Miami and Warren:	11.5	10.5	5	....

S. O. Ohio Cont'd

Kerosine Prices

(Off Statewide Level)

Kerosine prices are off statewide level in the following counties:

Allen, Auglaize, Champaign, Columbiana, Darke, Geauga, Greene, Hardin, Logan, Mahoning, Mercer, Preble, Putnam, Shelby, Trumbull and Van Wert *11.5
Paulding *11
Ashtabula *10.5
Fayette, Madison, Pickaway, Portage and Summit *8.5

†This price also to authorized agents, exclusive of 0.5c rental. Discount to undivided dealers: 0.5c less than divided dealer t.w.

*Ohio has kerosine tax of 1c per gal., not included in above prices.

Commercial Tank Wagon Q.D.A. to contract accounts: Effective Oct. 20, 1937, thru Ohio (except in 30 counties), on monthly purchases, off posted consumer t.w. price: 0 to 999 gals., 0.5c; 1,000 to 19,999 gals., 1.5c; 20,000 gals. and over, 2.5c. The 30 counties where Q.D.A. differs from statewide are: Allen, Ashtabula, Auglaize, Butler, Champaign, Cuyahoga, Darke, Defiance, Erie, Fulton, Geauga, Hamilton, Hancock, Hardin, Henry, Logan, Lorain, Lucas, Mahoning, Mercer, Ottawa, Paulding, Putnam, Sandusky, Scioto, Shelby, Trumbull, Van Wert, Washington, Williams and Wood.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices," S. O. Ohio says.

On kerosine, prices to resellers and commercial consumers are posted generally at 3c per gal. below consumer t.w. price in any quantity, when such prices are on statewide level.

S. O. Kentucky

Crown Gasoline
(Regular Grade)

	Consumer T.W.	Net Dlr.	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	12	9	6	10.5
Lexington, Ky.	13.5	10.5	6	10.5
Louisville, Ky.	13	10	6	10
Paducah, Ky.	10.5	7.5	6	10
Jackson, Miss.	12.5	9.5	7	*10
Vicksburg, Miss.	13	10	7	*10
Birmingham, Ala.	13.5	10.5	*8	12
Mobile, Ala.	13	10	*9	9.5
Montgomery, Ala.	12.5	10.5	*9	*12
Atlanta, Ga.	12	9	7	*12
Augusta, Ga.	12.5	9.5	7	*11.5
Macon, Ga.	14.5	11.5	7	*12
Savannah, Ga.	13	10	7	*11
Jacksonville, Fla.	12.5	9.5	8	8
Miami, Fla.	13	10	8	12.5
Pensacola, Fla.	11.5	8.5	*9	12
Tampa, Fla.	11	8	8	10.5

Kyso Gasoline
(Third Grade)

Covington, Ky.	10.5	8	6	....
Lexington, Ky.	12	9.5	6	....
Louisville, Ky.	11.5	9	6	....
Paducah, Ky.	10	7.5	6	....
Jackson, Miss.	10.5	8	7	....
Vicksburg, Miss.	11.5	9	7	....
Birmingham, Ala.	11.5	9	*8	....
Mobile, Ala.	10.5	8	*9	....
Montgomery, Ala.	11.5	9	*9	....
Atlanta, Ga.	10	7.5	7	....
Augusta, Ga.	11	8.5	7	....
Macon, Ga.	12.5	10	7	....
Savannah, Ga.	9.5	7	7	....
Pensacola, Fla.	10.5	8	*9	....
Tampa, Fla.	10	7.5	8	....

Discounts to all tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month.

**Taxes*: In the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have kerosine taxes of 1c per gal., and Mississippi 0.5c, not included in above prices.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:
Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. lots of more than 50 in bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 1/25c.
Kerosine inspection fee only: Iowa, 3/50c; Michigan, 1/5c per gal.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes shown in separate column, include* 1c *federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect July* 25, 1938, *as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown T.W.	Stanolind T.W.	Gasoline Taxes	Kerosine T.W.
Chicago, Ill.	11.6	9.6	6.4	4	10.5
Decatur, Ill.	11.6	10.1	8	4	10.5
Joliet, Ill.	11.6	10.1	8.4	4	10.5
Peoria, Ill.	11.6	10.1	9.6	4	10.5
Quincy, Ill.	11.4	9.9	8.8	4	10.3
Indianapolis, Ind.	12.3	10.8	8.9	5	*11.2
Evansville, Ind.	12.1	10.6	7.1	5	*11
South Bend, Ind.	12.6	11.1	9.2	5	*9
Detroit, Mich.	10.3	8.8	7.5	4	9
Grand Rapids, Mich.	10.8	9.8	9.8	4	9.7
Saginaw, Mich.	12.3	10.8	10.3	4	9.3
Green Bay, Wis.	12.4	10.9	10.2	5	10.3
Milwaukee, Wis.	11.8	10.3	9.5	5	10.7
La Crosse, Wis.	12	10.5	10	5	10.9
Minneapolis-St. Paul	12	10.5	10	5	10.9
Duluth, Minn.	12.4	10.9	10.4	5	11.3
Mankato, Minn.	12	10.5	10	5	10.9
Des Moines, Ia.	11.4	9.9	7.5	4	*10.3
Davenport, Ia.	11.6	10.1	9.6	4	*10.5
Mason City, Ia.	11.8	10.3	9.8	4	*10.7
St. Louis, Mo.	11.2	9.7	7.5	*4	10.1
Kansas City, Mo.	10.9	9.4	6.9	*4	8.5
St. Joseph, Mo.	10.9	9.4	8.9	*4	9.8
Fargo, N. D.	13.2	11.7	11.2	4	12.1
Minot, N. D.	14.5	13	12.5	4	13.4
Huron, S. D.	12.5	11	10.5	5	11.4
Wichita, Kans.	10.4	6.6	5.5	4	7.8

***Taxes:** in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax. Kerosine taxes: Indiana has 4c, Iowa 3c per gal. state tax, not included in above prices.

Discount to commercial consumers: Effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. prices; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals., or more, 1.5c off t.w. on Ethyl and Red Crown, and 1c on Stanolind (latter effective June 9, 1937). Minimum delivery is 25 gals.

S. O. Nebraska

Standard Red Crown Gasoline
(*Regular Grade*)

	T.W. Dealer	Gasoline Taxes	Kerosine T.W.
Omaha, Neb.	12	6	10.8
McCook	11.5	6	10
Norfolk	12.4	6	11.2
North Platte	12.4	6	11
Scottsbluff	13.5	6	12.3

Discounts to commercial consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

Essolene
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Little Rock, Ark.	7.75	10.25	7.5	10
Alexandria, La.	7.25	9.75	8	*9.5
Baton Rouge, La.	7.25	9.75	8	*11
New Orleans, La.	7.25	9.75	*10	*10
Lake Charles, La.	7.25	9.75	8	*11.5
Shreveport, La.	6	8.5	8	*8.5
Lafayette, La.	7.5	10	8	*11.5
Bristol, Tenn.	10.75	13.25	8	14.5
Chattanooga, Tenn.	10	12.5	8	13.5
Knoxville, Tenn.	10.5	13	8	14
Memphis, Tenn.	8.5	11	8	12
Nashville, Tenn.	9.5	12	8	10.5

***New Orleans** gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana has kerosine tax of 1c per gal.; in addition New Orleans has 1c parish tax, none of which are included in above prices.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective May 15, 1937, thru territory; commercial consumers taking 50 gals. or more at one time will be billed at posted consumer t.w. price; those taking less than 50 gals. at one time will be billed at 4c per gal. over posted consumer t.w. price. Generally, the posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Humble Oil & Refining Co.

Humble Motor Fuel
(*Regular Grade*)

	*T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
Dallas, Tex.	9	13	5	8
Ft. Worth, Tex.	9	13	5	8
Houston, Tex.	9.5	13.5	5	8
San Antonio, Tex.	9	13	5	8

U. S. Motor Gasoline
(*Third Grade*)

	*T.W.	S.S.	Gasoline Taxes
Dallas, Tex.	7	10	5
Ft. Worth, Tex.	7	10	5
Houston, Tex.	8.5	11.5	5
San Antonio, Tex.	7.5	10.5	5

*****Price is t.w. price to all classes of dealers and consumers.

Continental Oil

Conoco Bronze (*Regular Grade*)
Demand (*Third Grade*)

	Dealer Prices— Conoco Bronze	Demand	Gasoline Taxes	Kerosine T.W.
Denver, Colo.	10.5	9.5	5	11.5
Grand Junc., Colo.	14	13	5	15
Pueblo, Colo.	11.5	10.5	5	10.5
Casper, Wyo.	12	11	5	11.5
Cheyenne, Wyo.	8	7	5	13
Billings, Mont.	13.5	12.5	6	13
Butte, Mont.	13.5	10.5	6	15.5
Great Falls, Mont.	13	12	6	15.5
Helena, Mont.	14	13	6	15.5
Salt Lake City, Utah.	13	11.5	5	16
Boise, Ida.	15.5	14.5	6	18
Twin Falls, Ida.	15	14	6	18
Albuquerque, N. M.	11	10	†6.5	12
Roswell, N. M.	11	8.5	†6.5	10.5
Santa Fe, N. M.	12	9.5	*7	12
Muskogee, Okla.	9.5	6.5	5	7
Oklahoma City, Okla.	8.5	6.5	5	7
Tulsa, Okla.	9	6	5	7
Ft. Smith, Ark.	9.25	6.75	5	7.5
Little Rock, Ark.	9.25	7.625	7.5	8
Texarkana, Ark.	9	6	5	8

†Includes city tax of 0.5c.
*Includes 1c city tax.

S. O. California

Standard Gasoline
(*Regular Grade*)

	T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
San Francisco, Cal.	13.5	14.5	4	11.5
Los Angeles, Cal.	13	14	4	10
Fresno, Cal.	14.5	15.5	4	12.5
Phoenix, Ariz.	15.5	16.5	6	*12.5
Reno, Nev.	15.5	16.5	5	13.5
Portland, Ore.	14	15	6	13.5
Seattle, Wash.	14	15	6	13.5
Spokane, Wash.	17	18	6	16.5
Tacoma, Wash.	14	15	6	13.5

Flight Gasoline
(*Third Grade*)

San Francisco, Cal.	12	13	4	....
Los Angeles, Cal.	11.5	12.5	4	....
Fresno, Cal.	13	14	4	....
Reno, Nev.	14	15	5	....
Phoenix, Ariz.	14	15	6	....
Portland, Ore.	12.5	13.5	6	....
Seattle, Wash.	12.5	13.5	6	....
Spokane, Wash.	15.5	16.5	6	....
Tacoma, Wash.	12.5	13.5	6	....

*****Arizona has kerosine tax of 5c per gal., not included in above prices.

Discount to dealers: on gasoline, off t.w. price on Standard Ethyl and Standard Gasoline, to 100% dealers, 3c; to split dealers, 2c; on Flight gasoline, both 100% and split dealers, 2c.

On Stanavo Aviation Gasoline, to all classes of dealers, 3c off t.w.

To commercial consumers: off tank wagon price: on single deliveries of 40 gallons and over. Stanavo Aviation, Standard Ethyl and Standard Gasolines, 3c. Flight Gasoline, 2c per gallon. Tank wagon delivery, less than 40 gals., 1c per gal. above posted t.w. price. Discounts on kerosine: in tank cars, 3c off tank truck price; plant deliveries to jobbers, 2.5c below tank truck price.

Canada

PRICES OF IMPERIAL OIL LTD.
Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline
(*Regular Grade*)

	T.W.	Gasoline Taxes	Kerosine T.W.
Hamilton, Ont.	16	6	17
Toronto, Ont.	16	6	17
Brandon, Man.	21.1	7	22.3
Winnipeg, Man.	20.5	7	20.7
Regina, Sask.	19	7	22
Saskatoon, Sask.	21.3	7	24.8
Edmonton, Alta.	19.5	7	21.5
Calgary, Alta.	16.5	7	19
Vancouver, B. C.	16	7	23
Montreal, Que.	15	6	17.5
St. John, N. B.	14.5	10	18.5
Halifax, N. S.	14.5	10	18.5

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car, tank wagon or dealer prices, as indicated, of aviation gasoline in several marketing territories.

S. O. OHIO
Thru Ohio
Stanavo Ethyl Aviation

	Consumer T.W.	Gasoline Taxes
73 octane	15.5	5
80 octane	16.5	5
87 octane	17.5	5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA
Stanavo Ethyl Aviation Gasoline
73 Octane Number

Chicago, Ill.	14.9	4
Detroit, Mich.	16.5	4
Milwaukee, Wis.	15.1	5
Minneapolis, Minn.	15.3	5
St. Louis, Mo.	14.5	3
Kansas City, Mo.	14.2	*4
Fargo, N. D.	16.5	4
Huron, S. D.	15.8	5

*****Includes 1c city tax.

HUMBLE OIL & REFINING CO.
Aviation Gasoline

	Tank Car
Baytown, Tex.	8.5

CONTINENTAL OIL CO.
Conoco Special Gasoline

	Dealer	Gasoline Taxes
Denver, Colo.	14.5	5
Cheyenne, Wyo.	15	5
Helena, Mont.	17	6
Salt Lake City, Utah.	17.5	5
Albuquerque, N. M.	14	*6.5

*****Includes city tax of 0.5c.

S. O. CALIFORNIA
Stanavo Aviation Gasoline

	T.W.	
Phoenix, Ariz.	17.5	6
Los Angeles, Cal.	15	4
San Francisco, Cal.	15.5	4
Reno, Nev.	17.5	5
Portland, Ore.	16	6
Seattle, Wash.	16	6
Spokane, Wash.	19	6

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

	Posted Tank Wagon Prices Mineral Spirits	V.M.&P.
Newark, N. J.	11.5	15.5
Baltimore, Md.	15.5	....
Washington, D. C.	15	....

Discounts: Buyers taking following quantities, at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y.	11	12.5
*New York City	9.5	10.5
Rochester, N. Y.	12	12.5
Syracuse, N. Y.	12.5	15
Boston, Mass.	11.5	11.5
Bridgeport, Conn.	12	12.5
Hartford, Conn.	11	11.5
Providence, R. I.	11.5	12.5

*****Prices apply to consumers only in quantities over 1,000 gals. annually. For quantities under 1,000 gals. annually, add 0.5c per gal.

ATLANTIC REFINING CO.

Philadelphia, Pa.	11.5	12.5
Lancaster, Pa.	13	14
Pittsburgh, Pa.	12.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	12.5	13.5

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers, off t.w. price: 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect July 25, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. INDIANA

(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill.	16.2	16.5	15.9
Detroit, Mich.	19.2	18.7	19.7
Kansas City, Mo.	13.9	14.9	14.4
St. Louis, Mo.	14.2	15.2	13.1
Milwaukee, Wis.	18.8	19.8	19.3
Minneapolis, Minn.	19	20	17.7

Note: All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	10.5	9.5
New York Harbor	10	9
Philadelphia district	10.5	9
Boston	10.5	9.5
Providence	10.5	9.5
Ohio points, delivered	8.875	*8

*This is on rubber solvent.

Note: In Ohio, prices on D.C. naphtha and special. Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.5c less than on V.M.&P

Latest Changes

From July 19 to July 25 inclusive. Dates and amounts of changes shown. See table for full current prices.

Socony-Vacuum Oil—Mobilgas:

Consumer t. c. cut 0.25c, Bangor; 0.45c, Portland; 0.5c, Boston and Providence, July 22.

S. O. Indiana—Red Crown and Stanolind:

Red Crown t. w. and dealer price cut 1c, and Stanolind dealer cut 1.8c, Detroit, July 22.

S. O. Nebraska—Red Crown Gasoline:

T. w. cut 1.2c, McCook, July 20.

Kerosine:

Cut 0.5c, McCook, July 20.

Continental Oil—Demand Gasoline:

Denver up 1c, July 22.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes.

Continental Oil—Conoco Bronze:

Denver up 1.5c, July 12.

Demand Gasoline:

Denver up 0.5c, July 12.

Naphtha

S. O. Indiana—Stanisol:

Cut 0.8c, St. Louis, July 16.

Eastern

(Continued from page 48)

consequence were reported.

While an occasional report of price shading continued to be heard in the New York harbor market on high octane gasoline, generally all sellers asked at least 6.5 cents for this grade in barge lots, and 6.75 cents in tank cars.

The majority of independent suppliers and major companies reported they were holding this grade for at least 0.25 cent above these prices. Several said that market conditions at the Gulf have forced them to ask higher prices, and they preferred to hold their gasoline rather than back down to levels from which they advanced several weeks ago.

Heavy rains throughout the east have held down consumption, according to reports from distributors. One distributor said that instead of a normal increase of about 5 per cent, his volume the middle two weeks of July would be off more than 20 per cent from last year.

Low tank wagon prices in some areas in the east also were contributing some concern to jobbers, according to reports.

Wax

NEW YORK, July 25.—White crude scale wax prices were holding gains registered the past several weeks in a market where movement was spotty, according to reports of traders the week ended July 23.

Higher prices, it was pointed out here, generally have resulted more from a good balance in supply condition brought about by refinery shutdowns or curtailment, than from any increase of mention in foreign or domestic shipments.

Occasional reports of lower prices for domestic offerings of fully refined waxes were heard late in the week.

Fall Accessories Listed By Oil Company

CHICAGO — Pure Oil Co. announced to its dealers in its latest Pure Globe that its annual fall dating program on accessories will start in a few weeks.

A new Pure Oil battery set-up is to be announced to dealers next month.

Under the dating program dealers may acquire a stock of accessories and distribute the payments over four months.

Dealers are urged to check their stock of wiper blades, lamps, auto polish, battery cables, tire accessories, radiator stop leak and cleaner, fan belts, hose, spark plugs, fuses and batteries in preparation for the fall program.

Announcement was made to dealers also of a new Pure hot water heater designed for Ford automobiles, just added to the company's line of accessories. The heater is installed in the center of the cowling, below the dash panel. It is finished in cream color, has a three-inch copper core, 48 tubes, 45 fins, and a 6.5-inch, four-blade fan. Two adjustable thermostats are furnished. The 155-degree setting is for use with alcohol, and the 175-degree setting for use with permanent anti-freeze. The Pure also has its DeLuxe car heater of its general line.

100,000-Barrel Spheroid

ST. PAUL, Minn. — Two new storage tanks have just been completed at the St. Paul barge terminal of Socony-Vacuum Oil Co. In addition, a 100,000-barrel Horton spheroid tank is being erected which, when completed in September, will bring total gasoline storage capacity up to 6,825,000 barrels.

PHILADELPHIA — General Electric Co. has been awarded the contract for the propelling machinery for a third turbo-electric, 18,500-ton welded tanker to be built for the Atlantic Refining Co. by the Sun Shipbuilding & Dry Dock Co. at its Chester, Pa., yards. Scheduled for delivery in January, 1940, the new tanker and her sister ships, the "J. W. Van Dyke" and the "Robert H. Colley", will be the world's largest welded ships.

Pennsylvania Refinery Lubricating Oil Inventory

(Issued by National Petroleum Association)

	July 7 Gallons	July 14 Gallons
1. **Raw Long Residuum** (Including all raw long residuum below, and not salable, as 600 fire)	1,060,083	1,774,023
2. **600 Steam Refined** (Includes all steam refined stock commonly sold or used as 600 and as raw material for bright stocks)	7,497,891	7,537,149
3. **Other Steam Refined** (Not included in 1 and 2 above)	7,884,291	7,679,776
4. **Finished Dewaxed Long Res.**	2,579,972	2,269,654
5. **Bright Stock** (Does not include any material reported in 4, above)	21,783,519	20,968,438
6. **Viscous Neutral,** below 180 vis. but not below 142 vis. @ 100	7,941,928	8,034,463
7. **Viscous Neutral,** 180 vis. @ 100 and above	9,922,301	9,579,087

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Eastern Domestic

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	July 25	
District:	(a)60-64 Oct.	(a) 65 Oct. & Above
N. Y. harbor	6.50 – 6.75	6.75 – 7.00
(b)N. Y. harbor	6.25 – 6.50	6.50 – 6.75
Philadelphia	6.50	6.75
Baltimore	6.50	6.75
Norfolk	6.75 – 7.00	7.00 – 7.25
Wilmington, N. C.	6.75 – 7.00	7.00 – 7.25
Charleston, S. C.	6.75 – 7.00	7.00 – 7.25
Savannah	7.00 – 7.25	7.25 – 7.50
Jacksonville	7.00 – 7.25	7.25 – 7.50
Portland	7.00 – 7.50	7.25 – 7.75
Boston	6.50 – 7.00	6.75 – 7.00
Providence	6.50 – 7.00	6.75 – 7.00

WATER WHITE KEROSINE

District:			
N. Y. harbor	4.625–4.75	Charleston	5.00–5.25
(b)N. Y. harbor	4.50 –4.625	Savannah	5.25–5.50
Philadelphia	5.00 –5.25	Jacksonville	5.25–5.50
Baltimore	5.00 –5.25	Portland	5.60
Norfolk	5.00 –5.25	Boston	5.00–5.25
Wilmington, N.C.	5.00 –5.25	Providence	5.00–5.25

(c)FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	4.625– 4.75	4.50 – 4.625
Nos. 2-3	4.00 – 4.25	3.875– 4.125
No. 4	3.75 – 4.25	3.75 – 4.125
No. 5	$1.15	.....
No. 6	$0.95	.....
	Phila. dist.	**Balt. dist.**
No. 1	5.00 – 5.25	5.00 – 5.25
Nos. 2-3	4.25	4.25
No. 4	4.00	4.00 – 4.25
No. 5	$1.15	$1.15
No. 6	$0.95	$0.95
	Bost. dist.	**Prov. dist.**
No. 1	5.00 – 5.25	5.00 – 5.25
Nos. 2-3	4.00 – 4.25	4.00 – 4.25
No. 4	3.75 – 4.25	3.75 – 4.25
No. 5	$1.15	$1.15
No. 6	$0.95	$0.95

District:	(d)Bunker C Fuel	(d)Diesel Oil
N. Y. harbor	(f)$0.95	(g)$1.65–$1.75
Philadelphia	(f)$0.95	(g)$1.75
Baltimore	(f)$0.95	(g)$1.75
Norfolk	(e)$0.95	$1.75
Charleston	$0.90	$1.75
Savannah	(e)$0.90	$1.785
Jacksonville	(e)$0.90	$1.785
Tampa	(e)$0.85	$1.785
Portland	$1.05	$1.75
Boston	(f)$0.95	(g)$1.65–$1.75
Providence	$0.95	$1.65 –$1.75

	Gas Oil 28-34 Gravity	Diesel Oil Shore Plants
N. Y. harbor	4.00 – 4.25	4.00 – 4.25
Philadelphia dist.	4.25	....
Baltimore dist.	4.25	....
Norfolk dist.	4.25	....
Savannah dist.	....	4.25
Jacksonville dist.	....	4.25

Pacific Export

(i) (Quotations are at seaboard, Los Angeles, in cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	July 25	July 18
U. S. Motor, under 65 oct.	4.75 – 4.875	4.75 – 4.875
400 e.p. blend, under 65 oct.	4.875– 5.00	4.875– 5.00
400 e.p. blend 65 oct. & above	5.00 – 5.25	5.00 – 5.25
(h) 38-40 w.w. kerosine	4.25 – 4.75	4.25 – 4.75
41-43 w.w. kerosine	4.75 – 5.00	4.75 – 5.00
44 w.w. kerosine	5.25 – 5.50	5.25 – 5.50
In Cargo lots, per bbl.		
Dieselfuel, 24° & above	$1.10 –$1.15	$1.10 –$1.15
Diesel fuel, under 24°	$1.00 –$1.10	$1.00 –$1.10
(h)30-34 diesel (gas oil)	$1.15 –$1.30	$1.15 –$1.30
(k) Grade C fuel oil	$0.55 –$0.70	$0.60 –$0.70

Prices Effective	July 25	July 18
In Ships' Bunkers, or deep tank lots, per bbl.:		
(j)Diesel fuel oil	$1.525–$1.55	$1.525–$1.55
(k)Grade C fuel oil	$0.875–$0.90	$0.875–$0.90
Cased Goods: (Per case)		
U. S. Motor	$1.40 –$1.525	$1.40 –$1.525
400 e.p. blend, under 65 octane	$1.50 –$1.60	$1.50 –$1.60
400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.60 –$1.70
(h)40-43 w.w. kerosine	$1.30 –$1.40	$1.30 –$1.40
Kerosine, p.w.	$1.25 –$1.35	$1.25 –$1.35

New York Export

(Cents per gal. in bbls. F.a.s. New York)

CYLINDER OILS (Pennsylvania Products)

Bright stock:		
Light, 25 p.t.	19.50 –20.00	19.50 –20.00
Neutral oil:		
200 3 color, 25 p.t.	19.50 –20.00	19.50 –20.00
150 3 color, 25 p.t.	18.50 –19.00	18.50 –19.00
600 s.r., unfiltered	15.50 –16.50	15.50 –16.50
650 s.r., unfiltered	17.50 –18.50	17.50 –18.50
600 fl., s.r.	18.00 –19.00	18.00 –19.00
630 fl., s.r.	20.50 –21.50	20.50 –21.50

Wax, Domestic *and* Export

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, f.a.s., carloads. Domestic prices, f.o.b. refineries in New Orleans & New York districts in bags, carloads, with 0.2c discount allowed for shipment in bulk, except where noted below. Scale solid; fully refined, slabs in bags)

Prices Effective	July 25	
	New York	
	Domestic	Export
124-6 Y.C. scale	2.25 – 2.30	2.25 – 2.30
122-4 W.C. scale	2.25 – 2.30	2.25 – 2.30
124-6 W.C. scale	2.25 – 2.30	2.25 – 2.30
123-5 Fully rfd.	3.75	3.375– 3.50
125-7 Fully rfd.	3.90	3.50 – 3.625
128-30 Fully rfd.	(l)4.00	3.65 – 3.875
130-2 Fully rfd.	(l)4.35	4.00 – 4.125
133-5 Fully rfd.	(l)4.65	4.40 – 4.625
135-7 Fully rfd.	(l)4.90	5.00 – 5.125
	New Orleans	
	Domestic	Export
124-6 Y.C. scale	2.25 – 2.30	2.25 – 2.30
122-4 W.C. scale	2.25 – 2.30	2.25 – 2.30
124-6 W.C. scale	2.25 – 2.30	2.25 – 2.30
123-5 Fully rfd.	3.75	3.375– 3.50
125-7 Fully rfd.	3.90	3.50 – 3.625
128-30 Fully rfd.	(l)4.00	3.65 – 3.875
130-2 Fully rfd.	(l)4.35	4.00 – 4.125
133-5 Fully rfd.	(l)4.65	4.40 – 4.625

Gulf Coast

(F.o.b. ship, Gulf oil terminals; minimum 20,000 bbls.; representing traders' opinions)

Prices Effective	July 25	July 18
For Domestic shipment:		
MOTOR GASOLINE		
59 oct. & below	4.875– 5.125	4.875– 5.125
60-64 oct.	5.125– 5.25	5.125– 5.25
65-67 octane	5.375– 5.50	5.375– 5.50
68-70 octane	5.75 – 6.00	5.75 – 6.00
FUEL OILS		
No. 1	3.875– 4.00	3.875– 4.00
No. 2	3.50	3.50
KEROSINE		
41-43 w.w.	4.00	4.00
For Export Shipment:		
GASOLINE		
U. S. Motor	4.75 – 5.00	4.75 – 5.00
60-62, 400 e.p.	4.75 – 5.00	4.75 – 5.00
61-63, 390 e.p.	4.75 – 5.00	4.75 – 5.00
64-66, 375 e.p.	4.875– 5.00	4.875– 5.00
KEROSINE		
44 w.w.	(a) 4.25 –4.50	(a) 4.25 – 4.50
41-43 w.w.	4.00	4.00
41-43 p.w.	4.00	4.00

Prices Effective	July 25	July 18
GAS AND BUNKER OILS		
For Export Shipment		
Gas Oil (m):		
Below 43 diesel index	3.50	3.50
43-47 diesel index	3.50 – 3.625	3.50 – 3.625
48-52 diesel index	(a) 3.50 –3.625	(a) 3.50 –3.625
53-57 diesel index	(a) 3.625–3.75	(a) 3.625–3.75
For Domestic and /or Export Shipment		
Diesel Oil Ship's bkrs.	(o)$1.55–$1.75	(o) $1.55–$1.75
Grade C bunker oil for ship's bunkers	(o)$0.75	(o)$0.75
Grade C bunker oil, in cargoes	$0.65 –$0.70	$0.65 –$0.70

MID-CONTINENT LUBRICATING OILS

(Cents per gal. at Gulf; in bbls., f.a.s.; in bulk, f.o.b. terminals)

	July 25	
190-200 vis. D. 210 brt. stock	(p)Barrels 22.50 –24.50	Bulk 17.60 –17.75
150-160 vis. D 210 brt. stock:		
0-10 p.p.	19.00 –20.50	13.00 –14.75
10-25 p.p.	18.50 –20.00	12.50 –14.25
150-160 vis. E 210 brt. stock	18.50 –20.00	13.00 –14.50
120 vis. D 210 brt. stock	18.50 –20.00	13.00 –14.50

	July 25	July 18
180 vis. No. 3 color neutral:	Bulk	Bulk
0-10 p.p.	10.00 –10.50	10.00 –10.50
15-30 p.p.	9.50 –10.00	9.50 –10.00
200 vis. No. 3 color neutral:		
0-10 p.p.	10.00 –10.50	10.00 –10.50
15-30 p.p.	9.50 –10.00	9.50 –10.00
600 s.r. olive green	9.00 –11.25	9.00 –11.25
600 s.r. dark green	7.00 – 9.25	7.00 – 9.25

SOUTH TEXAS LUBRICATING OILS

(Vis. at 100° cold test 0, bulk export shipment, f.o.b. terminals.)

Unfiltered Pale Oils:

Vis.	Color		
100	No. 3	4.75 – 5.00	4.75 – 5.00
200	No. 3	6.25 – 6.75	6.25 – 6.75
300	No. 3	6.75 – 7.25	6.75 – 7.25
500	No. 3½	7.75 – 8.25	7.75 – 8.25
750	No. 4	8.25 – 8.75	8.25 – 8.75
1200	No. 4	8.75 – 9.25	8.75 – 9.25
2000	No. 4	9.00 – 9.50	9.00 – 9.50

Red Oils:

Vis.	Color		
100	No. 5-6	4.75 – 5.00	4.75 – 5.00
200	No. 5-6	6.25 – 6.75	6.25 – 6.75
300	No. 5-6	6.75 – 7.25	6.75 – 7.25
500	No. 5-6	7.75 – 8.25	7.75 – 8.25
750	No. 5-6	8.25 – 8.75	8.25 – 8.75
1200	No. 5-6	8.75 – 9.25	8.75 – 9.25
2000	No. 5-6	9.00 – 9.50	9.00 – 9.50

Note: Red oil prices cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate freight rates to Continental ports, shillings per ton of 2240 lbs., British sterling; U. S. ports cents per bbl.)

Rates Effective July 25

	Crude &/or Fuel		Refined Oil &/or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont. (q)	11/9	12/-12/6	12/	12/6-13/
Aruba-U.K./Cont. (q)	10/	10/-10/6	10/6	10/6-11/-
Gulf-N. Atlantic (r) (not E. of N.Y.):				
Hvy. Crude & fuel, (10 to 19.9 gravity)	15c	15c	....	....
Light Crude, (30 Grav. or Lighter)	15c	14-15c	....	....
Gasoline	....	....	15c	15-16c
Kerosine	....	....	16c	15-16c
Light Fuel	....	....	15c	15-16c

(a) Prices nominal. (b) In barge lots. (c) Fuel oils meet specifications of U. S. Commercial Standards CS12-35. (d) In ships' bunkers. (e) For barging, add 5c per bbl. (f) For barging, add 5 to 6c per bbl. (g) For barging, add 6.5 to 7.5c per bbl. (h) 150 fire point. (i) For San Francisco cargo prices, add 5c per bbl. to cargo prices shown above. (j) Pacific Specification 200. (k) Pacific Specification 400. (l) Shipment either in bags or in bulk. (m) Less than ½ of 1% sulfur. (n) No prices reported. (o) Barging 5c per bbl. additional at some Gulf ports. (p) Second-hand barrels. (q) Continental ports in range between Bordeaux and Hamburg, both inclusive. (r) Venezuela loading, same rate; Tampico, 2c to 3c per bbl. additional.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective June 13, 1938, except Corning June 16, 1938)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.46
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.40
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$1.30
Corning Oil in Buckeye Pipe Lines (Ohio)...$1.17

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.) (Effective June 13, 1938).....$1.80
*The Pennzoil Co.: (Effective June 13, 1938)
Penna. Grade Oil in National Transit Lines*$1.73
Ashland Oil & Transportation Co.:
Somerset Oil in Ashland Lines (Ky.):

(Effective July 1, 1938)

Big Sandy River.....$1.32
Kentucky River.....$1.40

*The Pennzoil Co. posts $1.73 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other lower districts range down to $1.68 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland, Midland County (Jan. 5, 1938)....$1.12

Posted by Simrall Pipe Line Corp.

(Effective Dec. 29, 1937)

West Branch, Arenac, and equal grades.....$0.80

(Effective Jan. 8, 1938)

Beaverton, Crystal, Greendale, Porter and equal grades.....$1.12
Buckeye, Bentley, Billings, Tobacco and equal grades.....$1.095

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)

Illinois, Princeton.....$1.35

(Effective June 22, 1938)

Owensboro, (Western Ky.).....$1.30

(Effective Nov. 20, 1937)

Lima, O.....$1.00

Posted by Owensboro Corp.

(Effective May 25, 1938)

Centralia, Ill.....$1.25

Posted by Stoll Oil Refining Co.

(Effective June 22, 1938)

Stoll Pipe Line Oil (Ky.).....$1.30

CANADIAN FIELDS

Posted by Imperial Oil Limited

Western Ontario

(Effective Sept. 9, 1933)

Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)

(Effective Jan. 5, 1938)

Crude Oil

40-40.9°	$1.14	53-53.9	$1.40
41-41.9	1.16	54-54.9	1.42
42-42.9	1.18	55-55.9	1.44
43-43.9	1.20	56-56.9	1.46
44-44.9	1.22	57-57.9	1.48
45-45.9	1.24	58-58.9	1.50
46-46.9	1.26	59-59.9	1.52
47-47.9	1.28	60-60.9	1.54
48-48.9	1.30	61-61.9	1.56
49-49.9	1.32	62-62.9	1.58
50-50.9	1.34	63-63.9	1.60
51-51.9	1.36	64-64.9	1.62
52-52.9	1.38		

Crude Naphtha, 65 grav. & above.....$2.14

Absorption Gasoline

90% Rec., 20 lb. Reid v.p.....$1.94
90% Rec., 17 lb. Reid v.p.....$2.08

†MID-CONTINENT

(Effective Jan. 28, 1937)

	(In Oklahoma-*Kansas)	(In North-North Central Texas)
Below 29	$1.06	$0.96
29-29.9	1.08	0.98
30-30.9	1.10	1.00
31-31.9	1.12	1.02
32-32.9	1.14	1.04
33-33.9	1.16	1.06
34-34.9	1.18	1.08
35-35.9	1.20	1.10
36-36.9	1.22	1.12
37-37.9	1.24	1.14
38-38.9	1.26	1.16
39-39.9	1.28	1.18
40 & above	1.30	1.20

†Prices shown in table posted by Standard Oil Co. (Indiana) in Okla.-Kans., and Stanolind Oil Purchasing Co. in Texas.

Above Stanolind prices met as follows:

Jan. 28, Continental Oil Co. met in Okla., Kans., and North Texas. Sinclair-Prairie met in North Texas and North Central Texas, Jan. 28, Stanolind's North Texas schedule. Same date, The Texas Co. met in North-North Central Texas.

Effective June 16, 1938, Kanotex Refg. Co. posted Okla.-Kans. crude, 34 & below, at $1.03, 35-35.9 at $1.05, plus 2c differential to 40 & above, at $1.15.

Note: Stanolind prices in Okla.-Kans. are for quantities computed by 97% tank tables. In Texas, 100% tank tables are used effective Oct. 1, 1937, volume corrected to 60° F., and deduction for full b.s. & w. content.

*Effective Aug. 1, 1937, for Otis-Albert pools Rush-Barton counties, Kans., 13c less.

Posted by Carter Oil Co.

In Oklahoma

(Effective Jan. 28, 1937)

Below 25	$0.98	33-33.9	$1.16
25-25.9	1.00	34-34.9	1.18
26-26.9	1.02	35-35.9	1.20
27-27.9	1.04	36-36.9	1.22
28-28.9	1.06	37-37.9	1.24
29-29.9	1.08	38-38.9	1.26
30-30.9	1.10	39-39.9	1.28
31-31.9	1.12	40 and above	1.30
32-32.9	1.14		

Above Carter schedule met Jan. 28 by the following companies: Sinclair-Prairie, Shell and Barnsdall in Oklahoma-Kansas; Skelly Oil in Kansas; Tide Water in Oklahoma; Pure Oil in Oklahoma-Kansas, beginning with below 24 at $0.98 and ending with 40 & above at $1.30.

Posted by Magnolia Petroleum Co.

(Effective Jan. 28, 1937)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.98 and ending with 40 & above, at $1.30.

In Texas: North and North Central, including Burkburnett, Archer, Henrietta, Electra, Comanche and Olden, same gravity and price schedule as Stanolind in North Texas, which see under Stanolind, beginning with below 29 at $0.96 and ending with 40 and above, at $1.20.

Jefferson County, Texas

	Beaumont (Magnolia) (Oct. 1, 1937)	West Beaumont (Humble) (May 1, 1938)
Below 21°	$0.95	$0.95
21-21.9	0.98	0.98
22-22.9	1.01	1.01
23-23.9	1.04	1.04
24-24.9	1.07	1.07
25-25.9	1.10	1.10
26-26.9	1.13	1.13
27-27.9	1.15	1.15
28-28.9	1.17	1.17
29-29.9	1.19	1.19
30-30.9	1.21	1.21
31-31.9	1.23	1.23
32-32.9	1.25	1.25
33-33.9	1.27	1.27
34-34.9	1.29	1.29
35-35.9	for	1.31
36-36.9	oil	1.33
37-37.9	34 & above	1.35
38-38.9		1.37
39-39.9		1.39
40 & above		1.41

TEXAS FIELDS

Posted by Humble Oil & Refining Co.

*(*West Central Texas)*

(Effective Jan. 28, 1937)

Below 29	$0.96	35-35.9	$1.10
29-29.9	0.98	36-36.9	1.12
30-30.9	1.00	37-37.9	1.14
31-31.9	1.02	38-38.9	1.16
32-32.9	1.04	39-39.9	1.18
33-33.9	1.06	40 and above	1.20
34-34.9	1.08		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young counties.

Shell Petroleum Corp., effective Jan. 28, posts Humble's above schedule on Fisher county crude, plus these five lower grades, beginning with below 25 gravity at $0.88; 25-25.9, $0.90; 26-26.9, $0.92; 27-27.9, $0.94, and 28-28.9, $0.96; rest of schedule same as Humble's in West Central Texas.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

**East Central Texas*

(Effective Jan. 28, 1937)

Below 29	$1.03	35-35.9	$1.17
29-29.9	1.05	36-36.9	1.19
30-30.9	1.07	37-37.9	1.21
31-31.9	1.09	38-38.9	1.23
32-32.9	1.11	39-39.9	1.25
33-33.9	1.13	40 and above	1.27
34-34.9	1.15		

*Including Anderson, Cherokee, Limestone, Navarro counties.

Same date, Sinclair-Prairie met in Mexia Humble's above schedule.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

	Gray County	Carson-Hutchinson
Below 35	$0.96	$0.91
35-35.9	0.98	0.93
36-36.9	1.00	0.95
37-37.9	1.02	0.97
38-38.9	1.04	0.99
39-39.9	1.06	1.01
40 & above	1.08	1.03

Jan. 28, above prices met by Sinclair-Prairie and Magnolia in the entire area and by Continental in Carson-Hutchinson and by Texas Co. in Panhandle Sweet, same as Humble's Gray Co. and on Panhandle Sour, same as Carson-Hutchinson.

EAST TEXAS

(Effective May 22, 1937)

Stanolind, Humble, Shell, Sinclair-Prairie, Texas Co., and Magnolia.....$1.35

Shell also posted on Jan. 28, in Livingston area, Polk County, Texas, $1.27.

NORTHEAST TEXAS

(Posted by Humble, Jan. 28, 1937)

Talco.....$0.73

(Posted by Magnolia, Jan. 28, 1937)

Cass County and Panola County, Tex.:

Same gravity and price schedule as S. O. Louisiana posts for Rodessa, La., which see under that company

(Posted by The Texas Co., Jan. 28, 1937)

Cass County.....$1.25

WEST TEXAS AND NEW MEXICO

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

(Including Andrews, Crane, Crockett, Ector, Glasscock, Howard, Winkler and Upton Counties, Texas and Lea county, New Mexico).

Below 26	$0.78	33-33.9	$0.94
26-26.9	0.80	34-34.9	0.96
27-27.9	0.82	35-35.9	0.98
28-28.9	0.84	36-36.9	1.00
29-29.9	0.86	37-37.9	1.02
30-30.9	0.88	38-38.9	1.04
31-31.9	0.90	39-39.9	1.06
32-32.9	0.92	40 & above	1.08

Pecos, West Texas.....$0.91

Jan. 28, Magnolia met Humble in Crane, Upton, Howard, Glasscock, Mitchell and Winkler.

Shell Petroleum Corp., on Jan. 28, met Humble in Crane, Glasscock, Howard, Pecos (except Yates shallow pool), Winkler, and Upton counties, Tex., and in Lea County, N. Mex. On Jan. 28, Shell posted in Yates shallow pool in Pecos county, Tex., $0.81. June 4, 1937, Shell added Ector county to West Texas postings.

Jan. 28, Stanolind Oil & Gas Co. met Humble in Hendrick field, Winkler county.

Jan. 28, Texas Co. met Humble in Ward and Winkler counties, Tex., and Lea County, N. M. except that its top grade is 36 and above, at $1.00.

April 20, 1937, Sinclair Prairie met Humble in Ward and Winkler, Tex. and Lea, N. M., counties, except that its gravity schedule ends with 36 and above, at $1.00.

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Artesia, Jackson and Maljamar pools, N. M...$0.90

COLORADO

(Posted by Continental Oil Co.)

(Effective Jan. 28, 1937)

Ft. Collins and Wellington

Below 29	$1.01	35-35.9	$1.15
29-29.9	1.03	36-36.9	1.17
30-30.9	1.05	37-37.9	1.19
31-31.9	1.07	38-38.9	1.21
32-32.9	1.09	39-39.9	1.23
33-33.9	1.11	40 & above	1.25
34-34.9	1.13		

Canon City and Florence, Col.....$1.10

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski fields.....$1.09
Pettus.....$1.37 Van Zandt.....$1.10

Jan. 28, Magnolia met Humble in Darst Creek; posted $1.00 in Luling; $1.12 in Lytton Springs; $1.27 for Cleveland, and $1.15 in Hardin, both in Liberty county, Tex. Effective July 11, 1938, Sun Oil Co. posted $1.15 for Hardin.

Jan. 28, 1937, The Texas Co. met Humble in Darst Creek.

Anahuac, Dickinson, Flour Bluff and Turtlebay

(Effective Jan. 28, 1937)

Below 31	$1.16	36-36.9	$1.28
31-31.9	1.18	37-37.9	1.30
32-32.9	1.20	38-38.9	1.32
33-33.9	1.22	39-39.9	1.34
34-34.9	1.24	40 and above	1.36
35-35.9	1.26		

Conroe, Raccoon Bend (Deep sand crude) Tomball and Satsuma

(Effective Jan. 28, 1937)

Below 29	$1.20	35-35.9	$1.34
29-29.9	1.22	36-36.9	1.36
30-30.9	1.24	37-37.9	1.38
31-31.9	1.26	38-38.9	1.40
32-32.9	1.28	39-39.9	1.42
33-33.9	1.30	40 & above	1.44
34-34.9	1.32		

Jan. 28, Magnolia met Humble in Tomball and Texas Co. met Humble in Conroe, beginning with 35-35.9 gravity.

Jefferson County, Tex.

West Beaumont, see prices under Magnolia in center column.

(*Continued on next page*)

CRUDE OIL MARKETS

(*Continued from preceding page*)

South-Southwest Texas (cont'd)

Posted by Humble
**Mirando*

(Effective July 6, 1937)

Below 21	$0.96	31-31.9	$1.18
21-21.9	0.98	32-32.9	1.20
22-22.9	1.00	33-33.9	1.22
23-23.9	1.02	34-34.9	1.24
24-24.9	1.04	35-35.9	1.26
25-25.9	1.06	36-36.9	1.28
26-26.9	1.08	37-37.9	1.30
27-27.9	1.10	38-38.9	1.32
28-28.9	1.12	39-39.9	1.34
29-29.9	1.14	40 & above	1.36
30-30.9	1.16		

*Includes Duval, Jim Hogg, Webb and Zapata counties, Tex. and Heyser and Placedo crudes.

July 6, Magnolia posted same schedule as Humble in Mirando.

July 6, 1937, Texas Co. posted for Duval-Mirando, $0.96 for below 21, plus 2c differential, to $1.12 for 28 & above.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

(Effective Jan. 28, 1937)

	*N. La.-Ark.	Rodessa, La.	Roanoke & N. Crowley, S. La. (Dec. 28, '37)	†Columbia County, Ark. (July 7, 1938)
Below 21°	$0.90	$0.93	$0.90	$0.83
21-21.9	for	for	.93	for
22-22.9	oil	oil	.96	oil
23-23.9	Below	Below	.99	Below
24-24.9	25°	25°	1.02	25°
25-25.9	$0.92	$0.95	1.05	$0.85
26-26.9	.94	.97	1.08	.87
27-27.9	.96	.99	1.10	.89
28-28.9	.98	1.01	1.12	.91
29-29.9	1.00	1.03	1.14	.93
30-30.9	1.02	1.05	1.16	.95
31-31.9	1.04	1.07	1.18	.97
32-32.9	1.06	1.09	1.20	.99
33-33.9	1.08	1.11	1.22	1.01
34-34.9	1.10	1.13	1.24	1.03
35-35.9	1.12	1.15	1.26	1.05
36-36.9	1.14	1.17	1.28	1.07
37-37.9	1.16	1.19	1.30	1.09
38-38.9	1.18	1.21	1.32	1.11
39-39.9	1.20	1.23	1.34	1.13
40 & above	1.22	1.25	1.36	1.15

*Includes Caddo, Homer, Haynesville, Sabine, De Soto, Sarepta, Carterville, El Dorado, Bunkie and Miller county.

†Includes Buckner, Magnolia, and Village pools.

Smackover, Ark. $0.90

Urania, La. (Ark. Fuel Oil Co., Jan. 28 '37). $1.02

Posted by Continental Oil Co.

*Tepetate, *Abbeville and *Ville Platte, La. $1.24

*Tepetate effective Jan. 28, 1937; Abbeville and Ville Platte, June 1, 1938.

Jan. 28, 1937, Magnolia met S. O. La.'s No. La.-Ark. gravity and price schedule in Pine Island, Haynesville, Bull Bayou and Cotton Valley, La., and in Eldorado and Rainbow districts, Ark.; and met S. O. La.'s Rodessa prices; and in Lockport, Iowa, Cameron Meadow, La., posted Humble's gravity and price schedule on Mirando. El Dorado East Field, Ark. price same as Smackover, effective Jan. 28, '37.

Jan. 28, The Texas Co. met S. O. La. in N. La., except that its gravity schedule begins with below 27 at $0.94. It posted $1.37 for Garden Island, La., $1.24 for LaFitte, La. and $0.90 for Smackover.

***GULF COASTAL FIELDS**

Posted by Humble Oil & Refining Co. and The Texas Co.

(Effective Jan. 28, 1937)

	Humble	Texas	Saxet (Humble) (July 6,'37)
Below 18	$0.95	°$0.95	....
18-18.9	for	for	....
19-19.9	below	below	....
20-20.9	21°	21°	$1.01
21-21.9	0.98	0.98	1.03
22-22.9	1.01	1.01	1.05
23-23.9	1.04	1.04	1.07
24-24.9	1.07	1.07	1.09
25-25.9	1.10	1.10	1.11
26-26.9	1.13	1.13	1.13
27-27.9	1.15	1.15	1
28-28.9	1.17	1.17	17
29-29.9	1.19	1.19	1.19
30-30.9	1.21	1.21	1.21
31-31.9	1.23	1.23	1.23
32-32.9	1.25	1.25	1.25
33-33.9	1.27	1.27	1.27
34-34.9	1.29	1.29	1.29
35-35.9	1.31	for	1.31
36-36.9	1.33	oil	1.33
37-37.9	1.35	34°	1.35
38-38.9	1.37	and	1.37
39-39.9	1.39	above.	1.39
40 & above.	1.41	....	1.41

†Refugio

(Effective July 6, 1937)

Posted by Humble

20-20.9	$1.01	23-23.9	$1.07
21-21.9	1.03	24-24.9	1.09
22-22.9	1.05	25-25.9	1.11

Rest of schedule same as Humble's Gulf Coastal crude prices.

†Includes Saxet, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor crude.

*Humble's prices apply in these Texas fields: Amelia, Barbers Hill, Clinton, Goose Creek, Hull, Liberty, Mykawa, Orange, Pierce Junction, Racoon Bend, (shallow sand), Sugarland, Thompsons, and West Columbia. Same prices also apply, effective Feb. 1, 1938, in Clinton, Tex., posted by Stanolind Oil Purch. Co.

Jan. 28, Sinclair-Prairie met above Humble schedule in full.

‡$0.95 for oil below 21° posted April 1, 1938.

July 6, 1937, The Texas Co. posted for Refugio, which includes Greta, Saxet and Taft: $1.01 for below 21, plus 2c differential, to $1.17 for 28 & above.

Texas Co. postings in Gulf Coastal Texas include: Arriola, Five Corners, Ganado, Humble, Liberty, Magnet, Manvel, Markham, Mauritz, McFaddin, Pickett Ridge, Port Neches, Sour Lake, West Columbia and Withers. In Gulf Coastal Louisiana: Bay St. Elaine, Caillou Island, Dog Lake, Four Isle, Gillis, Horseshoe Bayou, Iberia, Lake Barre, Lake Pelto, Leesville and Port Barre.

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Jan. 28, 1937)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma, Kansas which see under Mid-Continent crude on previous page.

(Effective Jan. 6, 1938)

Tensleep, Salt Creek field $0.70

(Effective Jan. 28, 1937)

Greybull-Torchlight $1.30
Ils, light, Col 1.18
Ils, heavy 1.12
back, N. M. 1.33
Big Muddy 1.23

(Effective July 8, 1938)

Elk Basin, light $1.05
Grass Creek, light 1.05

(Effective May 1, 1938)

Frannie light $0.65
Grass Creek, heavy 0.50
Hamilton Dome, Wyo. 0.45

(Effective Nov. 4, 1936)

Frannie heavy $0.62

Posted by Ohio Oil Co.

(Effective July 8, 1938)

Elk Basin, Wyo. $1.05
Grass Creek, light 1.05

(Effective Jan. 28, 1937)

Rock Creek 1.205
Lance Creek 0.97

(Effective May 1, 1938)

Grass Creek heavy $0.50

(Effective Nov. 16, 1937)

Sunburst, Mont. $0.90

Posted by Continental Oil Co.

(Effective Jan. 1, 1938)

Cat Creek, Mont. $1.30

(Effective Jan. 28, 1937)

Big Muddy, Wyo. $1.18
Lance Creek, Wyo. 0.97

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937; Greeley-Canal, July 9, 1938; Santa Maria Valley, by Union Oil, May 20, 1932.

Gravity	Signal Hill (Long Beach) El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills Midway-Sunset Lakeview Area	Greeley-Canal (Kern County)	Lost Hill	Coalinga	Wheele Ridge	Santa Maria (Union Oil)
13-13.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	$0.40
14-14.9	$0.80	$0.79	$0.74	$0.78	$0.79	$0.80	$0.76	....	....	$0.80	$0.76	$0.76	$0.77	$0.78	....	$0.70	....	$0.70	$0.70	$0.70	$0.70	....	$0.70	.42
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.44
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.45
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.46
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.47
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.70	.74	.74	....	.74	.71	.70	.48
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	....	.70	.78	.78	....	.78	.72	.70	....
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	....	.73	.82	.82	....	.82	.74	.70	....
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	....	.77	.87	.87	....	.86	.78	.72	....
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	....	.80	.92	.92	....	.90	.82	.76	....
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	....	.84	.97	.97	....	.94	.86	.79	....
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	....	.88	1.01	1.01	....	.98	.90	.83	....
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.92	1.03	.90	....	.91	1.06	1.06	....	1.02	....	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.96	1.06	.95	....	.95	1.10	1.10	$0.91	1.06	....	....	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	.99	1.10	.99	....	.99	1.15	1.15	.94	1.10	....	....	....
29-29.9	1.17	1.15	.93	1.18	1.18	....	1.17	1.12	.93	....	1.09	....	1.03	1.14	1.03	....	1.02	1.20	1.20	.98	1.14	....	....	....
30-30.9	1.21	1.19	.95	1.22	1.21	....	1.21	1.17	.95	....	....	....	1.07	1.17	1.08	....	1.06	1.25	1.25	1.02	1.18	....	....	....
31-31.9				....	1.24		1.24	1.22	.97	....	....	....	1.11	1.21	1.12	....	1.09	1.29	1.29	1.06				....
32-32.9	*Elwood Terrace			....	1.27		1.27	1.27	1.00	....	....	....	1.14	1.25	1.16	....	1.13	1.34	1.34	1.09	Kettleman Hills			....
33-33.9	....	1.28	....	....	....		....	1.32	....	....	....	....	1.18	1.28	1.20	....	1.17	1.38	1.38	1.13	....	1.19	....	....
34-34.9	....	1.32	....	....	....		....	1.37	....	....	....	....	1.22	1.32	1.25	....	1.20	....	....	1.17	....	1.23	....	....
35-35.9	....	1.35	....	....	....		....	1.42	....	....	....	....	1.25	....	1.29	....	....	....	....	1.20	....	1.27	....	....
36-36.9	....	1.39	....	....	....		....	1.46	....	....	....	....	1.29	....	1.33	....	....	....	....	1.24	....	1.31	....	....
37-37.9	....	1.43	....	....	....		....	1.51	....	....	....	....	1.32	....	1.37	....	....	....	....	1.28	....	1.35	....	....
38-38.9	....	....	....	....	....		....	1.56	....	....	....	....	1.36	....	1.42	....	....	....	....	1.31	....	1.39	....	....
39-39.9	....	....	....	....	....		....	1.61	....	....	....	....	1.40	....	....	....	....	....	....	1.35	....	1.43	....	....
40-40.9	....	....	....	....	....		....	1.66	....	....	....	....	1.43	....	....	....	....	....	....	1.39	....	....	....	....
41-41.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.43	....	....	....	....
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F. O. B. Standard Pipe Line

*F. o. b. ship.

‡Also McKittrick, Kern River. Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted.

†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

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Coming Meetings

Mississippi Oil Dealers, Jackson, Miss., some time in Sept.

American Chemical Society, Milwaukee, Wis., Sept. 5 to 9.

Kentucky Petroleum Marketers Assn., annual fall conference and golf tournament, Brown Hotel and Big Spring Golf Club, Louisville, Sept. 8.

National Petroleum Assn., 36th annual meeting, Hotel Traymore, Atlantic City, Sept. 14, 15 and 16.

Oil Trades Assn. of New York, sports day, Pelham Country Club, Pelham, N. Y., Sept. 20.

National Association of Petroleum Retailers, annual meeting, St. Louis, Sept. 27, 28 and 29.

American Assn. of Petroleum Geologists, mid-year meeting, under direction of West Texas Geological Society, El Paso, Tex., Sept. 27-Oct. 2.

National Lubricating Grease Institute, 6th annual meeting, Chicago, Oct. 3 and 4.

Ohio Petroleum Marketers Assn., fall conference and golf tournament, Ohio Hotel and Southern Hills Country Club, Youngstown, O., Oct. 5, 6.

American Institute of Mining and Metallurgical Engineers, Petroleum Division, San Antonio, Tex., Oct. 6, 7.

New England States Tax Officials Assn., 26th annual conference, Bangor, Me., Oct. 6, 7.

Society of Automotive Engineers, national regional fuels and lubricants meeting, Tulsa, Okla., Oct. 6 and 7.

American Gas Assn., Atlantic City, N. J., Oct. 10 to 14.

National Safety Congress, Petroleum Section, Hotel Stevens, Chicago, Ill., Oct. 10 to 14.

Indiana Independent Petroleum Assn., Fall convention, Hotel Severin, Indianapolis, Ind., Oct. 12 and 13.

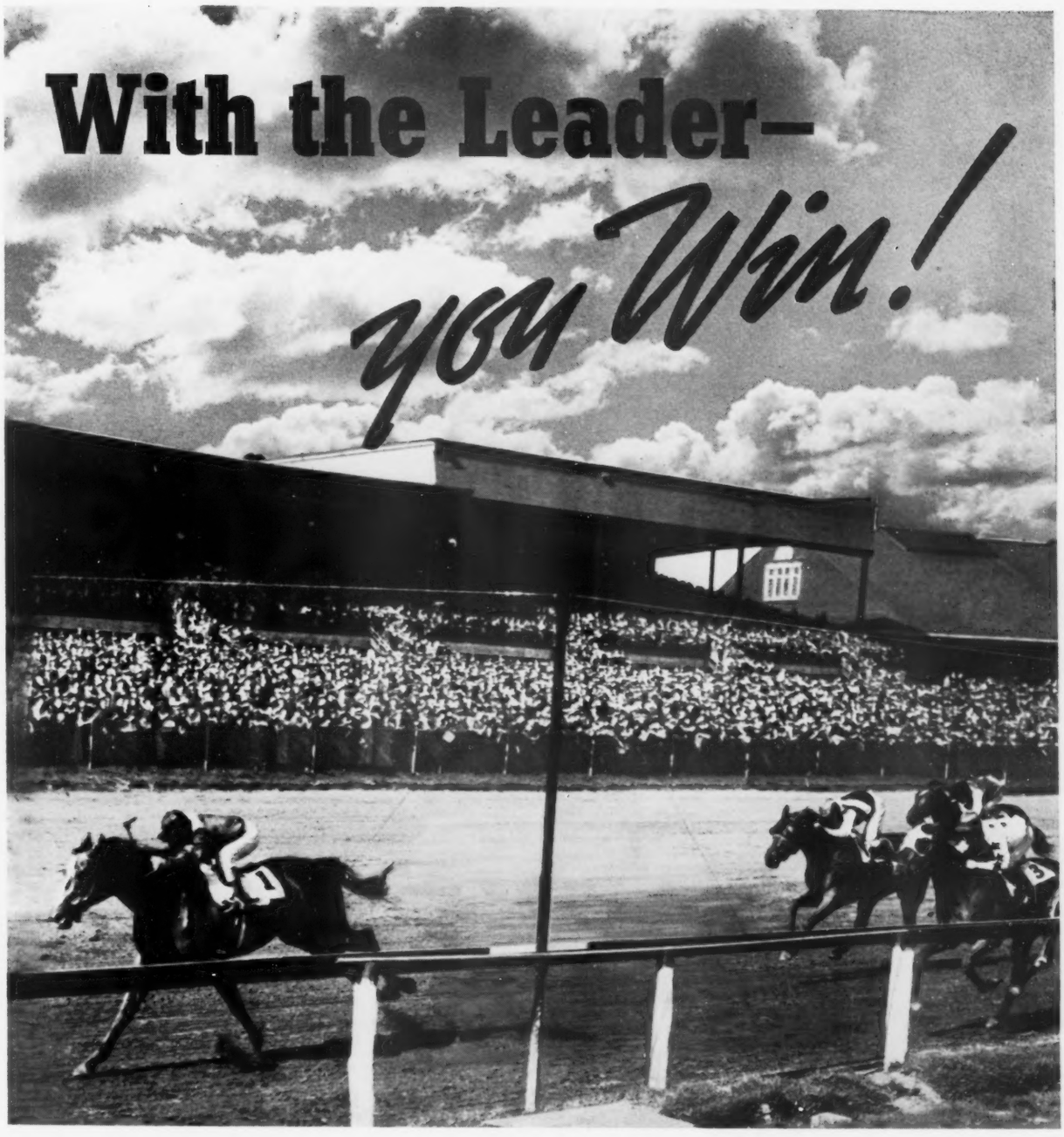
National Stripper Well Assn., annual meeting, Tulsa, Okla., Oct. 18.

Oklahoma Stripper Well Assn., annual meeting, Tulsa, Okla., Oct. 18.

Independent Petroleum Assn. of America, Tulsa, Okla., Oct. 19, 20 and 21.

American Inst. of Mining & Metallurgical Engineers, Petroleum Divsn., Los Angeles, Oct. 20, 21.

National Assn. of Credit Men, Petroleum Refiners Divsn., Indianapolis Athletic Club, Indianapolis, Ind., Oct. 24, 25, 26.



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● Lester G. Metcalf, recently made director of manufacturing of Union Oil Co. of California, started in the pipeline department of that company in 1913, saw 18 months' service in the World War, rejoined the company and traveled upward via machinist foreman, refinery engineer, superintendent of the Oleum refinery, assistant refineries manager and manager of refineries in 1930. He succeeds R. E. Haylett, deceased. Aside from his more direct official duties he has been active in promoting safety and other employe welfare work.